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Agricult.

vol 15

The Gift of the
Hon B P Johnson,
Corresponding Secretary
of the New York State
Agricultural Society,
at Albany
Rec'd 22 November 1854

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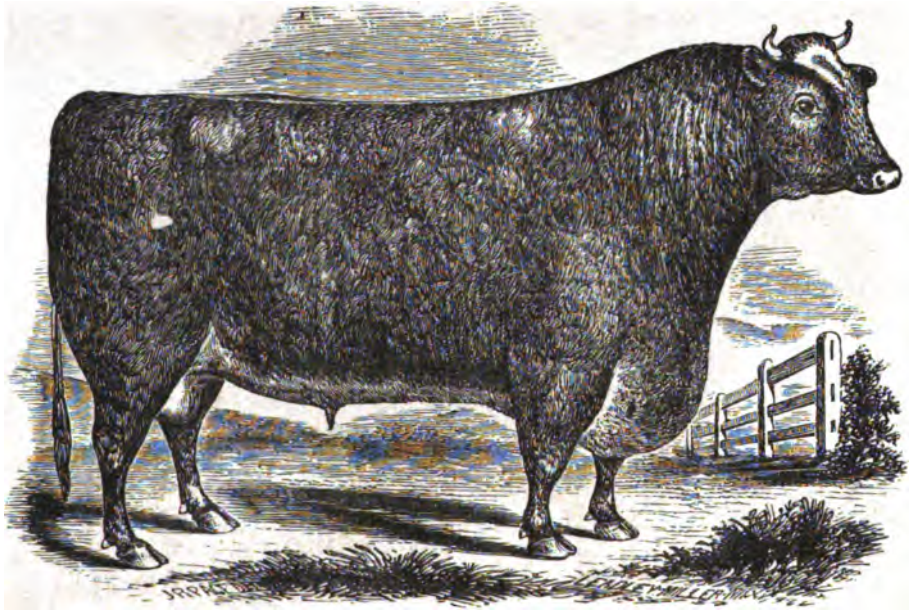

HALTON (11552).

Short Horn Bull. Winner of the First Prize at Rochester, 1851, in class of Foreign Stock, and the First Prize in Domestic Stock at Utica, in 1852, and a Diploma awarded at Elmira, 1855, in the class of Extra Stock. PEDIGREE—Color, red roan; calved 20th August, 1847; bred by Geo. Vail, Esq., of Troy, N. Y.; the property of S. P. Chapman, Mount Pleasant Farm, Clockville, Madison Co., N. Y.; got by Meteor, 104, (11811); dam, [Lady Barrington, III,] by Cleveland Lad, (8407); g. d. [Lady Barrington, II,] by Belvidere, (1706); gr. g. d. [Lady Barrington,] by a son of Mr. Mason's Herdman, (304); gr. gr. g. d. [Young Alicia,] by Wonderful, (700); gr. gr. gr. g. d. [Old Alicia,] by Alfred, (23); gr. gr. gr. gr. g. d. by Young Favorite, son of Favorite, (252)

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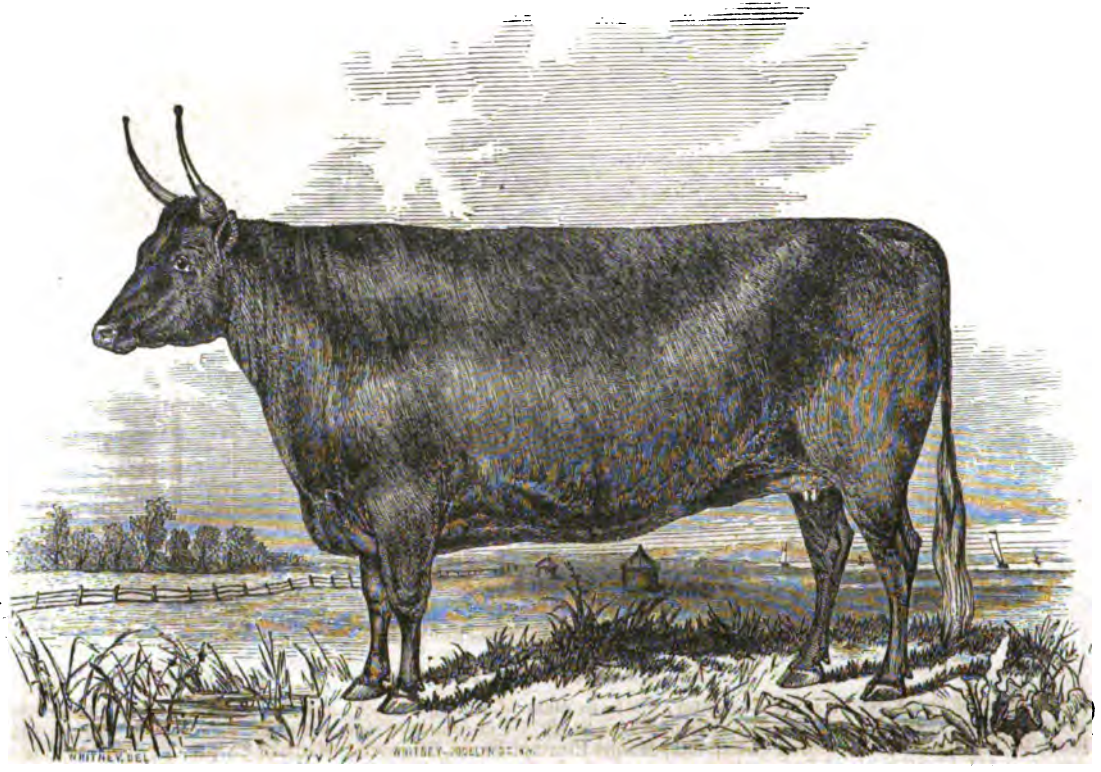

TITANIA (1084.)

Winner of the First Prize in Two Year Old Class of Devons, at the New-York State Agricultural Show, at Elmira, 1855, and at the United States Agricultural Show, at Boston, 1855. Imported and owned by Edward G. Faile, West Farms, Westchester Co., N. Y. Bred by George Turner, of Barton, near Exeter, England.

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TRANSACTIONS

OF THE

N. Y. State Agricultural Society,

WITH AN

ABSTRACT OF THE PROCEEDINGS

OF THE

COUNTY AGRICULTURAL SOCIETIES.

VOL. XV.—1855.

ALBANY:
C. VAN BENTHUYSEN, PRINTER TO THE LEGISLATURE,
No. 407 Broadway.

1856.

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vol 15

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NOTICE.

The Fifteenth Volume of the Transactions of the New-York State Agricultural Society is submitted to the farmers of New-York. Every effort in our power has been made to present a volume worthy of the State and of the Society. We shall be disappointed if this volume does not secure the approbation of those for whose benefit it has been prepared. A very large portion of the papers submitted are of a character which must commend them to the careful study of the farmer.

The continuation of Dr. Fitch's work on the insects of the State, will be found of great interest, and will add to the reputation of that distinguished entomologist. It opens to the farmer and horticulturist, the habits of the depredators upon their crops and fruit, and suggests remedies for their relief. This work is developing for practical purposes, and for the benefit of the people, what hitherto, notwithstanding the immense expenditure which has been made, had not been secured. The conclusion of this work will give a pre-eminence to our State in the great field of *practical* investigation, which will command the approbation not only, but the admiration of the world.

The essay of F. B. Hough upon "climate," is one of great practical value. It opens a field of investigation that should lead practical men to look into, and avail themselves of the facts and principles here set forth, that will be of immense advantage to them in all their operations.

Mr. Howard's essay on grasses, and herbage plants, fills a place long unoccupied, and will commend itself to every farmer in our country. The very able address of Gov. Wright, on grasses, has already elicited attention throughout our country, and will, in connection with Mr. Howard's essay, we trust, secure attention to this great interest, and lead to the cultivation of those grasses best adapted to the dairy and to grazing, and thus advance these very important interests as they deserve.

The second part of Watson's "Practical Husbandry," devoted to stock husbandry, will be found eminently useful to the farmers

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of our State. Designed for the practical farmer, it aims to give, in a brief and comprehensive form, and in simple and familiar terms, the history and merits of the different breeds of animals, and the most approved methods of breeding and rearing them.

The farm reports, and the articles on draining are among the most valuable which have been published; and when so many inquiries are being made on the subject of farm management and draining, these articles will be read with interest.

A very valuable report on the manufacture of cheese, by Hon. G. Denniston of Steuben county, will prove highly useful to those embarking in this important branch of agriculture.

The address of Hon. Samuel Cheever has already secured the approbation of the thinking and reflecting men of our country; it will be read with profit by our farmers, will lead them to appreciate their high calling, and to adopt measures to place it securely in that high position to which it is justly entitled in our country.

The proceedings of many of our County associations are of very great interest, and papers will be found that show most clearly the advances which are making in our State, that must gratify every friend of improvement, and stimulate to renewed exertions to advance the great farming interest of our State.

The reports of the Wool Growing Association of Western New-York, will be found deserving of careful perusal. The importance of this branch of agricultural pursuits is most ably set forth, and we anticipate renewed efforts to secure to it more attention, and still higher attainments in its every branch.

We cannot fail to express our deep sense of obligation to gentlemen who have aided us in presenting this volume to the people. Their counsel and their contributions have been most valuable, and we trust they will reap a rich reward in the approbation which shall be accorded to the work.

B. P. JOHNSON.

State Agricultural Rooms, *March*, 1856.

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NEW AGRICULTURAL ROOMS.

We congratulate the farmers of New-York that they have at last secured for their use, the most commodious and well arranged building which can be found in this country. To obtain this has been a labor of years, and of no ordinary character. Notwithstanding the various obstacles which have been encountered, we have succeeded, and the rooms now in our charge are the admiration of every visitor; and the farmer will find, as he visits the Capital of the State, that there is prepared for him, as convenient and well arranged rooms, as are allotted to any other class of our citizens. We ask the farmers to fill these rooms with the choicest products of their farms, make them truly exhibition rooms, where the results of their labors may be examined with interest and profit by all. A very commodious lecture room is prepared, where it is hoped, during the session of the legislature, lectures may be delivered, which shall prove advantageous to the farmers and mechanics of our State. A laboratory also will be prepared, where investigations will be made to promote the interest of the tiller of the soil, and give him the advantage of all the improvements and discoveries of science.

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CONSTITUTION OF THE NEW-YORK STATE AGRICULTURAL SOCIETY.

The style of this Society shall be "The New-York State Agricultural Society." It objects shall be to improve the condition of Agriculture, Horticulture, and the Household Arts.

SEC. 1. The Society shall consist of such citizens of the State as shall signify in writing, their wish to become members, and shall pay on subscribing not less than one dollar, and annually thereafter one dollar, and also of Honorary and Corresponding members.

The Presidents of County Agricultural Societies, or a delegate from each, shall, ex officio, be members of this Society.

The payment of ten dollars or more, shall constitute a member for life, and shall exempt the donor from annual contributions.

SEC. 2. The officers of the Society shall consist of a President, eight Vice-Presidents, one to be located in each Judicial District; a Recording Secretary, a Corresponding Secretary, a Treasurer, an Executive Committee, to consist of the officers above named, and five additional members, and five of the Ex-Presidents shall be ex officio members of the Executive Committee, and these five shall consist of the five Ex-Presidents whose term of office has last expired, of whom three shall constitute a quorum; and that the Ex-Presidents of the Society, not members of the Executive Committee, shall constitute a Board of councillors, to which may be referred, for consultation and advice, all questions that may from time to time arise, and in the decision of which the Society may in any manner be interested; and a General Committee, the members of which shall be located in the several counties, and be equal to the representations in the House of Assembly.

SEC. 3. The Recording Secretary shall keep the minutes of the Society. The Corresponding Secretary shall carry on the correspondence with other societies, with individuals, and with the General Committee, in the furtherance of the objects of the Society.

The Treasurer shall keep the funds of the Society, and disburse them on the order of the President or a Vice President, counter-

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signed by the Recording Secretary, and shall make a report of the receipts and expenditures at the annual meeting in January.

The Executive Committee shall take charge of, and distribute or preserve all seeds, plants, books, models, &c., which may be transmitted to the Society; and shall have also the charge of all communications designed or calculated for publication, and so far as they may deem expedient, shall collect, arrange and publish the same in such manner and form as they shall deem best calculated to promote the objects of the Society.

The General Committee are charged with the interests of the Society in the counties in which they shall respectively reside, and will constitute a medium of communication between the Executive Committee and the remote members of the Society.

SEC. 4. There shall be an annual meeting of the Society on the second Wednesday of February, in the city of Albany, at which time all the officers shall be elected by a plurality of votes, and by ballot, with the exception of the General Committee for the counties, which may be appointed by the Executive Committee, who shall have power to fill any vacancies which may occur in the officers of the Society during the year. Extra meetings may be convoked by the Executive Committee. Fifteen members shall be a quorum for the transaction of business.

SEC. 5. The Society shall hold an Annual Cattle Show and Fair at such time and place as shall be designated by the Executive Committee.

SEC. 6. This Constitution can be altered by a vote of two-thirds of the members present at any annual meeting, upon one year's previous notice in writing.

STATE AGRICULTURAL ROOMS,
February, 1856.

I certify the above to be a true copy of the Constitution of the New-York State Agricultural Society.

B. P. JOHNSON,
Cor. Secretary.

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LIFE MEMBERS ADDED IN 1856.

A.

ALLEN, LEWIS F., Black Rock.
ALLEN, Wm. M., Harlem
AGNEW, ALEXANDER, New-York.

B.

BALCOLM, URI, Corning.
BROWN, Wm. SMITH, New-York.
BOORMAN, JAMES, Hyde Park.
BROWN, LEWIS M., New-York.

C.

CURTIS, E. L. B., Danby.
CROMWELL, Wm., New-York.

D.

DATER, PHILIP, New-York.
DEFREEST, JOHN I., Defreestville.

F.

FAIRBANKS, HORACE, St. Johnsbury, Vt.
FURMAN, JOHN M., New-York.
FOX, Wm. W., West Farms.

G.

GAULEY, Wm. M., New-York.

H.

HASTINGS, GEORGE F., Shushan.
HOADLEY, LUTHER, Harwinton, Ct.

J.

JONES, EDWARD, Rhinebeck.

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L.

LEGGETT, EDWARD W., Harlem.
LOCKWOOD, E., New-York.
LOCKWOOD, GEORGE, New-York.

M.

MILLER, JAMES M., New-York.
MILLER, DANIEL S., New-York.
McGRAW, JOHN, West Farms.
MORTIMER, JOHN H., New-York.

P.

PEASE, R. H., Albany.
POST, WM., New-York.
PAYTON, THOMAS, New-York.
PHELPS, PETER, Derby, Ct.

S.

SHERMAN, C. A., New-York.
SHERMAN, B. L., New-York.
SPAULDING, HENRY F., New-York.

V.

VAN ANTWERP, JOHN, West Farms.

W.

WILKIN, J. W., Middletown.
WEED, WM. H., New-York.
WILSON, CATLIN, Eutaw, Ala.
WESTON, FREDERIC, Sandy Hill.
WENDELL, HERMAN, M. D., Albany.

LIFE MEMBER DECEASED DURING THE YEAR.

AUGUSTUS CLARKSON, Potsdam.

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OFFICERS FOR 1856.

PRESIDENT,
THEODORE S. FAXTON, Utica, Oneida county.

VICE PRESIDENTS,
1st district, JONATHAN THORNE, New-York.
2d district, EDWARD G. FAILE, Westfarms, Westchester county.
3d district, HERMAN WENDELL, Albany.
4th district, WILLIAM KNOX, Canajoharie, Montgomery county.
5th district, ENOCH MARKS, Camillus, Onondaga county.
6th district, FRANCIS M. ROTCH, Louisville, Otsego county.
7th district, D. W. C. VAN SLYCK, Lyons, Wayne county.
8th district, ALONZO S. UPHAM, Le Roy, Genesee county.

CORRESPONDING SECRETARY,
BENJAMIN P. JOHNSON, Albany.

RECORDING SECRETARY,
ERASTUS CORNING, Jr., Albany.

TREASURER,
BENJAMIN B. KIRTLAND, Albany.

EXECUTIVE COMMITTEE,
HUGH CROCKER, Utica, Oneida county.
C. S. WAINWRIGHT, Rhinebeck, Dutchess county.
GEORGE J. J. BARBER, Homer, Cortland county.
ALRIC HUBBELL, Utica, Oneida county.
JAMES BRODIE, Ellisburgh, Jefferson county.

EX-PRESIDENTS, EX-OFFICIO MEMBERS,
HENRY WAGER, WILLIAM KELLY,
LEWIS G. MORRIS, SAMUEL CHEEVER.

CHEMIST TO THE SOCIETY,
Prof. E. S. CARR.

ENTOMOLOGIST,
ASA FITCH, M. D.

MONTHLY MEETING OF THE EXECUTIVE COMMITTEE—FIRST THURSDAY IN EACH MONTH.

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State of New-York.

No. 217.

IN ASSEMBLY, MAR. 21, 1856.

COMMUNICATION

From the Corresponding Secretary of the New-York State Agricultural Society.

STATE AGRICULTURAL ROOMS,
March 21, 1856.

To the Hon. ORVILLE, ROBINSON,
Speaker of the Assembly:

In pursuance of the acts of the Legislature for the promotion of Agriculture, I present herewith the annual report of the New-York State Agricultural Society, with the proceedings of the Executive committee, and abstracts of the reports of County societies for 1855.

Very respectfully yours,
B. P. JOHNSON,
Cor'g Secretary.

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TRANSACTIONS

OF THE

New-York State Agricultural Society.

Report of the Executive Committee for 1855.

TO THE LEGISLATURE OF THE STATE OF NEW-YORK.

The progress made in agriculture during the past year, has been most encouraging, and we congratulate the farmers of New-York on the prosperity which they are permitted to enjoy. There has never been more unanimity and good feeling displayed at our State and County exhibitions since they have been organized, and the result is witnessed in the superior displays that have been made, exceeding those of any previous year.

Increased efforts have been put forth to advance the agriculture of our State in every department, and this has been most strikingly displayed in the new and valuable implements and machinery, for the use of the farmer, which have been brought into operation. The results of efforts heretofore made in the various departments of farm husbandry are being exhibited in every portion of our State, and that decided progress has been made is most apparent. Those who have for a time hesitated as to the propriety of engaging in the various improvements that have taken place, are beginning to interest themselves, and no person who has visited and examined with care our agricultural districts, can hesitate to acknowledge that there has been most marked improvement. Not only the farm itself has been greatly improved in neatness of cultivation, but the farmers' residences and out buildings, which are springing up in all parts of our State, show that great and manifest

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improvements have been made; and in many portions of our State the farmers' residences, for convenience and neatness of arrangements, will compare favorably with those of any other class of our citizens.

Who that recollects the unwieldly implements of former times but must acknowledge that the improved implements of the present day have aided the farmer most materially in the cheaper and better cultivation of his farm, and in securing his crops.

The exhibition of implements in the Museum of the Society, imperfect as it is, shows most forcibly the advance which has been made, as the old wooden plow of 1780 is compared with the improved plow of 1855, and the grain reaper and mower, which have added within the last two years untold millions to the wealth of our country, still further exemplify the advance which has been made. And this improvement has but just begun, and its progress is onward, until we shall witness the steam plow in its progress over our farms, thus diminishing labor and expense in this important department of farm husbandry. We might dwell at length upon this subject, did the limits of the report permit.

The past season has been one of prosperity, diminished somewhat by the severe rains of autumn, which affected the wheat and potatoe crops injuriously, still the yield has been abundant, prices remunerating, and the farmers are in a condition of ease and prosperity perhaps unequaled in the history of our State.

Drainage.—The increasing attention to drainage, and deep cultivation where needed, is among the most cheering indications of what is now doing for the advancement of agriculture. The great reduction of expense in cultivation where drainage has been resorted to, as well as the increased crops, have called the attention of farmers to the subject, and we are gratified in being assured in the various County reports, as well as from the examinations we have made, that the subject is now eliciting the careful attention of the agricultural interest. And while very much remains to be done, it is most encouraging that the recommendations of the society are being so extensively carried out in practice. *Irrigation*, also, which has but lately been brought to the attention of the farmers, is now attracting notice, and several experiments, which have proved highly successful, will be found among the papers presented for publication, and the question as to the water best suited for irrigation, which is

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undergoing discussion and examination, is one of very great importance.

The management of farms, as presented in the reports before the executive committee, exhibits a most commendable and praiseworthy attention to the improvements of the present day. The executive committee decided that the farms offered for premiums should be visited by some members of the board, as it was evident that the statements of the competitors, however minute and full, did not, after all, give the true state of the farm as it would appear on examination. The Secretary, with a member of the board residing in the judicial district in which the farms were located, visited the farms entered for premiums. The condition of the farms entered was in the highest degree gratifying, and it will be seen from a perusal of the report of the committee who visited the farms, as well as from the farm statements that taken as a whole we have never had presented so many farms in any previous year of such uniform excellence. In some instances the farms, as they appeared when visited and examined in June and July last, could scarcely be excelled. Every attention had been bestowed upon the minutest portion of the land, and system and order so perfect that but little could be suggested in regard to their management under the system of husbandry which had been adopted. So fully impressed with the importance of a personal examination of farms offered for premiums are the executive committee, that they would recommend its continuance in such form as shall be deemed best by their successors, and that separate premiums be given on grazing and grain farms.

Manures.—The importance of more reliable experiments in relation to the application of manures has been a matter of deep interest to the board, and they have endeavored to urge it upon the farmers as worthy of their most careful attention. While it is not expected that without an experimental farm, we can attain that certainty and reliability, which a course of well directed experiments for years under a competent person, with scientific acquirements to conduct them, would give us, it is most encouraging to learn that every year is adding to the number of those who are giving their attention to this matter. The inquiries at the rooms of the Society as to the value of the various manures, which are in market, as well as their comparative value with barn-yard manure, have been far in advance of any previous year. From some of the counties we have very

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interesting statements. One from Oneida, on the cultivation of corn, we give as in the right direction, and this is but one of many similar efforts that have come under our notice, all indicating that our farmers are making efforts to advance themselves in their calling.

Statement of H. H. Eastman, of Marshall, Oneida county, of his experiments in raising Indian corn in 1855:

Different kinds of manures used.	Manures how applied.	Quantities of manures used.	Weight of produce in the ear. lbs.	oz.	Rate per acre. bu.	lbs.
No manure, ...	.....	.....	30	8	52	50
do	.....	.....	30	8	52	50
Compost,*	In hill.	Half shovelful.	48		82	68
do	Top hill.	do	25		43	15
Quick lime, ...	In hill.	Half handful, .	33½		57	63
do	Top hill.	do	30		52	50
Gypsum, ...	In hill.	do	36		62	16
do	Top hill.	do	33		57	03
Ashes, ...	In hill.	Small handful.	30	12	53	10
do	Top hill.	do	38	8	66	38
Equal parts lime, gypsum and ashes,	In hill.	do	32	4	55	52
do	Top hill.	do	35	8	61	25
Guano†	In hill.	Table spoonful.	20		34	40
do	Top hill.	do	33	8	57	63
Guano & superphosphate of lime,‡...	In hill.	do of each.	51	4	88	41
do	Top hill.	do	37		63	67
Superphosphate of lime,§	In hill.	Table spoonful.	37	8	64	57
do	Top hill.	do	45		77	55
Equal parts poudrette, superphosphate of lime and guano,‖	In hill.	do	43		74	23
do	Top hill.	do	33	8	57	63
Poudrette, ...	In hill.	Handful.....	41	12	72	11
Night soil compost.	In hill.	Double handful	33	4	57	33
Hog manure, ...	In hill	do	49		84	49

* Composed 4 muck, 4 hog manure, 1 lime and 1 ashes.
† Intermixed with soil. Seed injured.
‡ Superphosphate on seed. Guano on outer edge of hills.
§ In contact with the seed.
‖ Intermixed with the soil.

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Different kinds of manure used.	Manures how applied.	Quantity of manures used.	Weight of produce in the ear. lbs.	oz.	Rate per acre. bu.	lbs.
Unfermented horse manure,.....	In hill.	Half shovelful.	39	12	68	49
do	Top hill.	do	28		48	28
Hen manure, ...	In hill.	Handful.....	48		82	68
Carb. of lime	In hill.	do	42		72	42
No manure, ...	.....	.....	32		55	22

The above experiment consists of twenty-eight rows, and forty hills in each row. The ground was green sward plowed early in the spring, about four inches deep, harrowed thoroughly and marked out into rows two ways at right angles—three feet apart each way. Planted 12th of May, with a "white flint" variety of corn. The cultivation of the growing crop consisted mostly in the use of the cultivator, which was run through between the rows four times alternately in different directions; with one slight hoeing only with hand hoe. Soil, gravelly loam. I calculate the cost of cultivation, not including cost of manure nor interest of land, at about $13 per acre. The corn stood upon the hill till killed by the frost, when it was husked, each row separately, and weighed in the ear, allowing seventy pounds to the bushel."

In addition to this, quite a number of specimens of marls from different parts of the State have been sent here for analysis during the year, and most of them have proved very valuable fertilizers. There can be no doubt that inexhaustible deposits of this character will be found, and when brought into actual use will prove highly advantageous. When the laboratory in the new building is completed, we shall be able to meet promptly all calls for analyses.

The *Entomological examinations* making under the direction of Dr. Asa Fitch, Entomologist of the Society, is progressing most satisfactorily. The first report published in the Transactions of 1854, has fully sustained the reputation of this distinguished Entomologist, and has convinced our farmers of the inestimable value of this work for their use. The report which will be presented of his labors for the present year will be still more satisfactory and valuable. We are happy to notice the commendations which have been bestowed upon the labors of Dr. Fitch, by men of science in all parts of our country. We trust the same liberality that has characterized the proceedings of the Legislature on this subject, will be continued until New-

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York will be able to present the world a complete Entomological History of the insects of our State, of their habits and depredations, and of the best means to resist their attacks upon our crops and fruits. Such an one we are satisfied will be given us if Dr. Fitch is spared to complete his valuable work.

The executive committee had anticipated a suitable work on the *Edible Fishes* of our State, and of the best means of increasing desirable species in our waters, that are not now to be found. The success which has attended the propagation of fish in England and France, and in some parts of our own country, has demonstrated the entire feasibility of the work and we hope to be able during the coming year to secure a report that shall be satisfactory and which will enable us to avail ourselves of the successful methods elsewhere adopted.

During the last session of the Legislature an act was passed facilitating the formation of Agricultural and Horticultural societies; as this act has some provisions which are very important for the successful operations of the societies, particularly those in relation to holding real and personal estate for their use, it is hoped that societies will avail themselves of its provisions and reorganize under it, as many have done already. The act will be found in the Transactions for 1854.

The Wool Growers' Association.—An association for the advancement of this great interest has been formed in Western New-York, and has held one exhibition which was most successful, and the proceedings will be found embodied in the report submitted. We are gratified in announcing the formation of this association. The interest which is represented by the wool growers of our State is a most important one, and should be encouraged and sustained.

Fifteenth Annual Exhibition.—For the first time since the Society held its annual fairs one has been held in the southern tier of counties. Many of the tried friends of the society had serious doubts as to the success of the exhibition in that section of the State. Those however who were most familiar with the resources of that portion of our State, and with the enterprize and energy of the inhabitants were entirely confident, that a fair held there would not only be successful so far as the Society was concerned, but would prove as advantageous to the farmers and mechanics of the State as any fair ever held. The Society believing that it was justly due to that section of the State, that an exhibition should be held there, the object of the Society

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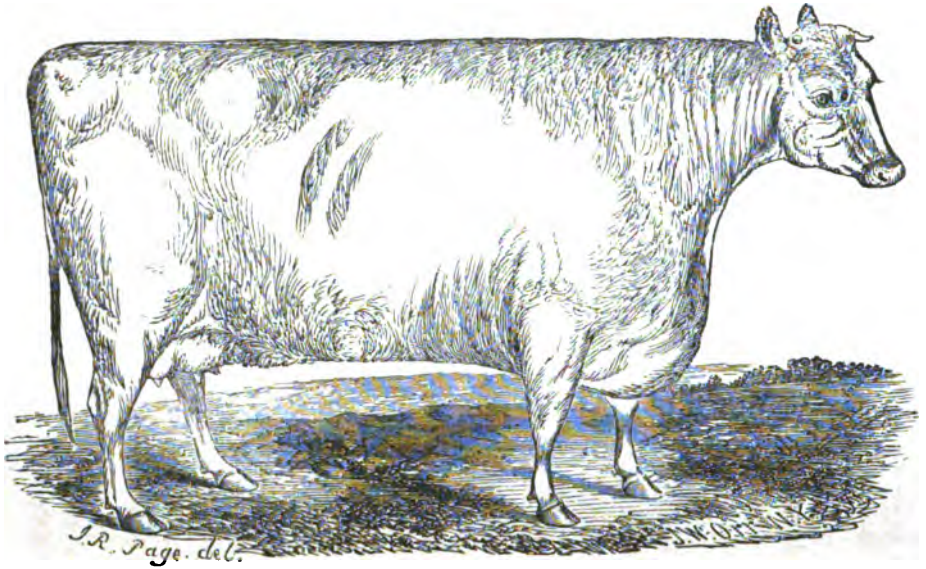

DUCHESS.

Short Horn Cow. Winner of the first prize of $25 at Elmira. 1855. Bred by and the property of S. P. Chapman, Mount Pleasant Farm, Clockville, Madison County, N. Y. PEDIGREE—Color, white; calved June 25th, 1849; got by Duke of Wellington (8654); dam [Matilda] by White Jacket (5647); g. d. [Hart] bred by and imported into America by the late Thomas Hollis, formerly of Blythe, England, (See Am. Hd. Book, Vol. 1, page 201.)

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being to do the most good possible by its exhibitions, having a due regard to its resources, so as to sustain its operations, located the fair at Elmira.

The advantages which were anticipated to the farmers of our State, were more than realized by the results of the exhibition, and we are convinced that every other portion of the State represented there will be equally benefited by the opportunity afforded of witnessing the prosperity and intelligence of a portion of our State, which previously had never been visited and examined, by many who were present at the Fair.

The exhibition was held from the 1st to the 5th of October, and in its arrangements, in all its circumstances, of the combined action of the Society and the citizens of Elmira, will be remembered as one of the most acceptable to which the wise policy of the Society has ever invited the attendance of the people. Although a portion of the time the weather was peculiarly unfavorable, yet the last two days were all that sun and sky could combine to promote in all respects the comfort and pleasure of the immense multitude who were present. The people came in tens of thousands, and from the days of this exhibition have been drawn thoughts, ideas and opinions of the progress which has been made in agriculture under the auspices of the Society, whose effects will be traced in the improved condition of the farm, in the enhanced prosperity of the farmer, through a large and extended space of country, and for a long series of years.

The public assemblages of this country on various occasions of political or literary interest have been often of very powerful numbers, but it is doubtful whether this State has ever witnessed a more interesting gathering of intelligent, investigating, reflecting citizens than were convened within the inclosures of the fair on Thursday 4th of October. It filled every hall, thronged every department. To all that was there arranged and displayed, of that which was most valuable in stock, ingenious in implements and machinery, or beautiful in fabric, this crowd, preserving order, and complying cheerfully with every regulation, gave the most earnest attention. The society can have no pleasanter incidents attending the discharge of the heavy and responsible duties assigned to it, than to see the people in their strength interesting themselves under circumstances best adapted to develope before them the resources

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of our State, in the departments in which they were most interested. This vast attendance presented unusual interest from the fact, that at this fair for the first time the Society had placed itself in the southern tier of counties; a section of the State which has produced some of the warmest and most intelligent friends of the cause and of the Society, and which is rapidly rising into a solid and well earned prosperity.

The location at Elmira seemed particularly appropriate, for here were concentrated a series of communications by railways and canals, reaching in all directions to the most settled portions of our own State, and not less directly to the great State lying immediately south. It enabled the Society, to welcome so large a delegation and visitors from Pennsylvania, that it seemed almost as if the efforts of both States had blended in one great effort to promote the agricultural interest. Nor from Pennsylvania alone, from other States of the Republic, gentlemen abundantly competent to judge with sagacity of the value of the objects presented for their estimation were present, and undoubtedly, from a fair so successful, returned to their own homes to make renewed efforts to advance whatever will cause the earth, by judicious culture, to contribute to the prosperity and happiness of those who pursue the noblest of pursuits. Probably the occurrence of this fair has presented years in advance, to many an intelligent mind, the knowledge of the great water and iron avenues over which much of the mineral and agricultural wealth of the two most populous States of the Republic shall interchange

The gentlemen selected to perform the delicate, as well as laborious, duties of judges, had every opportunity for a profitable discharge of their important work, and their decision, it is believed, met the approbation of the great body of competitors. Their duties were peculiarly arduous from the higher grade of excellence presented to them in almost every branch of the exhibition. The Society was greatly pleased to witness in this respect the most gratifying advance that has been made since the first exhibition was held. With mediocrity, with imperfection, with pretension, the exhibitor is no longer satisfied. The effort now is, to produce the best in all the departments, and in comparison between what was seen at the commencement of the labors of the Society and what is now produced, the Society may well feel satisfied that a great and good work has been accomplished.

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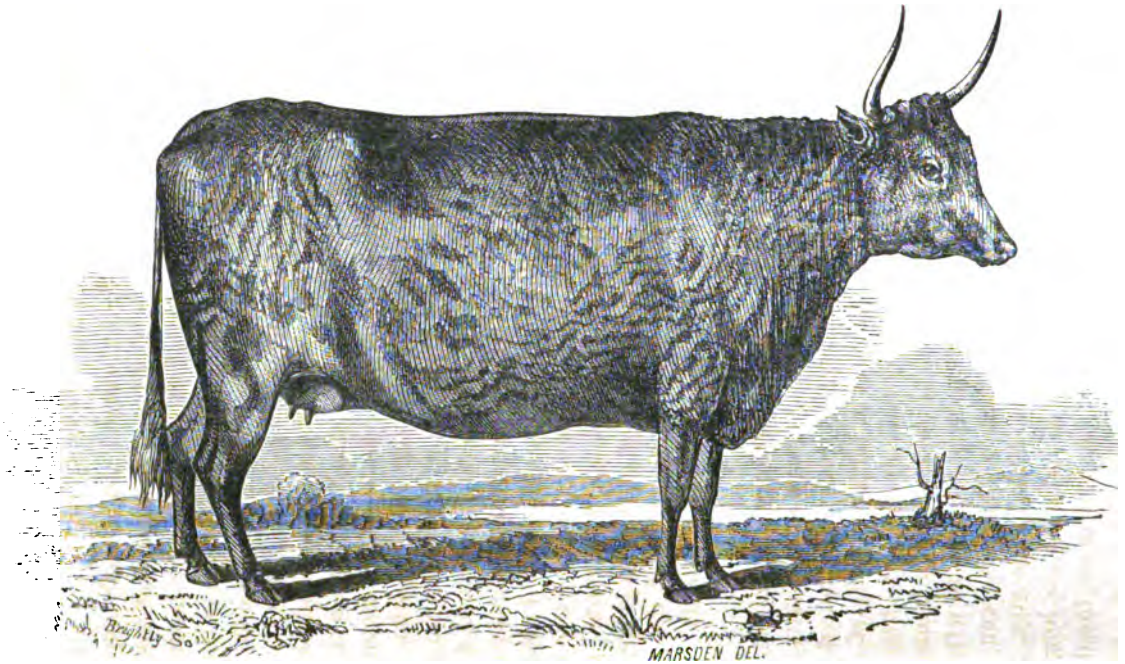

EDITHA (680.)

Winner of the First Prize of $25, at Elmira, 1855. PEDIGREE—Calved June 18th, 1851; sire, Megunticook, (251); grandsire, Prince Albert, (102); dam, Moss Rose, (904) by Duke of York, (87); g. d., Nonpareille, (924) by Prince Albert, (102); gr. g. d. bred by Mr. Halse, Devonshire, England.

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Among the many distinguished gentlemen present, the late chief magistrate of Pennsylvania, Gov. Bigler, was warmly welcomed by the President and other officers of the Society. He took active part in displaying to the best advantage the great wealth of his own state, the use of and traffic in which is to form so large a part in the commerce between the States, in which the increased crops of the farmers of New-York, from abundant harvests, will realize such constant and so profitable a share.

His Excellency, Joseph A. Wright, of Indiana, was welcomed by an immense audience, who listened with interest to the admirable address delivered before the Society. It was in itself high honor to the Society, and to the cause of agriculture, that the chief magistrate of a powerful, wealthy and advancing commonwealth should, from his distant home, come to address the farmers of New-York. It was a theme to be discussed of the value of which Indiana was itself a high example. Agriculture, that had changed the hunting grounds of the Indian to the granary of the nation. Gov. Wright's name is added to the illustrious list of the distinguished in position and in intellect, who from year to year have pronounced before the Society words of wisdom.

The citizens of Elmira, in all their arrangements and conduct, evinced an earnest desire to fulfil faithfully every pledge made when the Society was invited to send thither its annual gathering. Everything was done in time and in order, and no section of the State will be remembered with more lively recollections for its kindness and hospitality, and its faithful discharge of obligations assumed, than will Elmira and its hospitable citizens.

The perusal of the Transactions will indicate the valuable character of the different departments. From the most practical and useful implements and machinery (never excelled at our exhibitions), to the most delicate and graceful of the ornamental, recognised as pleasant companions to labor, this exhibition indicated that the farmers of the State of New-York, the mechanic, the florist, the horticulturist, the artist, and the farmers' wives and daughters are winning in every advancing year additional triumphs.

Favored by an intelligent and ever vigilant press, the accounts of the fair were circulated all over the Union, and they were read with an interest that indicated that the movements of the farmer are ranked among the themes of greatest value.

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This fair, honored by an assemblage of the people so vast—the people themselves coming up to judge how faithfully the Society fulfilled its trust—has greatly encouraged the Society. It proves an undiminished interest in the people. It shows to those who have for many years struggled to advance an important cause into a permanent institution, possessed of the friendship and confidence of the whole people, that they have succeeded, and it is the most valuable encouragement for the future.

The Society is greatly indebted to the intelligent and faithful services of the general superintendent, and those under his charge, for the admirable manner in which the whole exhibition was carried out after the fair was opened; not a single case of disturbance was reported, and it is believed that on no previous occasion has such a multitude of people assembled together so entirely peaceful and so perfectly obedient to the requirements of the fair.

Meetings were held each evening during the fair for the discussion of matters interesting to farmers and fruit growers, and the discussions were engaged in by men qualified to impart valuable instruction, and were very fully attended. It is hoped that this will be made a permanent feature of all our exhibitions, as the advantages arising from these discussions are most apparent.

New Agricultural Hall.—Since our last annual meeting, by the liberality of our Legislature, a building most creditable to the State, has been erected, and our winter exhibition is open in one of the capacious rooms set apart for the farmers of New-York. For several years has this subject been presented to the successive Legislatures, who have assembled within these walls, and at length through the energy and perseverance of tried friends of agriculture of 1854 and 1855 in the Legislature, the necessary appropriations were secured, and the Commissioners of the Land Office, to whom the erection of the work was entrusted, and the contractors employed, have prepared a building with accommodations for the Society, made under their own directions, most ample for years to come, and within the appropriation. Our Museum can now be enlarged so as to be an ornament to the State—a most acceptable and instructive resort for the farmer. Here at last, at the seat of government, the farmer is recognized, and we urge upon the farmer and mechanic to make this building worthy of the purpose for which it was erected; let your products and implements of every kind suit-

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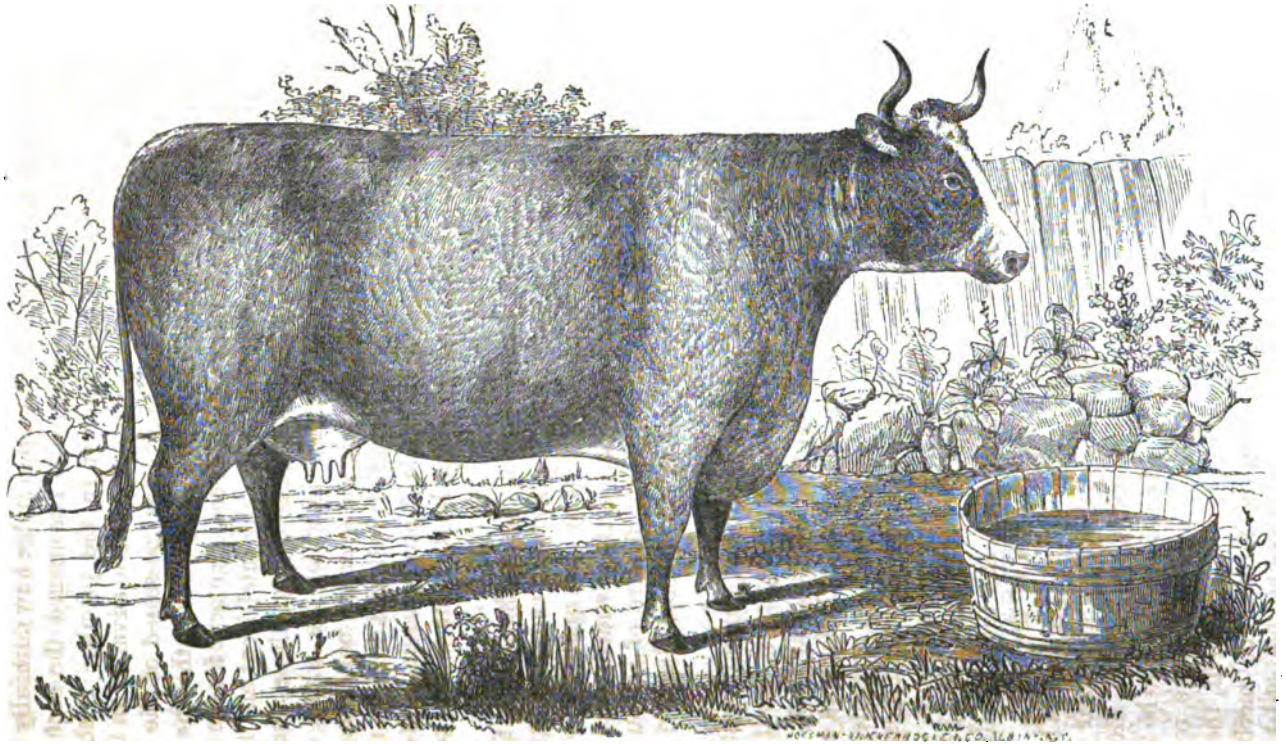

ROSE.

Hereford Cow, the property of John H. Lapham, Penn Yan, N. Y., winner of the First Prize of $25, at Elmira, 1855. PEDIGREE—Calved April 4th, 1845; bred by Wm. H. Sotham; sired by "Sir George, No. 1," by a son of "Sir George," in England, he by "Waxy," (403) [E. H. B.]; dam, "Perfection," by "Major," by "Noble," [E. H. B.,] (238): g. d. "Poll," by "Noble," (543); gr. g. d by "Sovereign," (404)

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able for permanent exhibition, find a place here, so that as time rolls on, we may have a most instructive exhibition, which shall develope for all time to come the progressive advance of the agriculture of our State. We feel the more gratified at the completion of this work where the farmer is recognized and acknowledged, since many of us have witnessed for years the attempts that have been made to prevent a public recognition of the claims of that great interest upon which all our other interests are more or less dependant; but the day of deliverance has dawned, and men begin to appreciate the importance of that great industrial class of our citizens, nearly equalling in numbers all the rest, and as they shall advance in knowledge, as science shall develope more and more the bountiful products of the earth, they will still more readily, it is believed, yield to the farmer the high position it is his right to occupy, and which by the blessing of Heaven he will maintain in our State for all time to come. We most cordially invite the farmers of the State, when they visit the city, to make this a place of resort, where every effort will be made to interest them in the collection which will be open for their benefit.

Agricultural Education.—It would scarcely be thought necessary that in a country like ours where intelligence among the population is so indispensable to the perpetuity of our free institutions, we should be called upon to urge the subject of education for the sons and daughters of farmers to their consideration. It is nevertheless a matter that requires at our hands serious consideration. As yet we have not a single school in our State where instruction combined with practice, adapted to the wants of the farmer, is given: and can there be any good reason assigned for this? We think not. "Practice with science" is what the farmers need fully to develope the resources of our farms, and at the same time to place the farmer in a position where he will be able to meet the other professions in point of equality as to his acquirements. And why, may we not inquire, are our legislators so backward in providing for this large class of our fellow citizens. While hundreds of thousands of dollars have been expended in the Natural History survey of our State, as yet the farmer, for whose benefit this survey was undertaken, has scarcely been reached, and may we not then with propriety urge this subject upon the attention of our representatives, and ask them to give us the means, by which some direct results, advantageous to the farmer shall be

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secured. The expenditures for the practical education of our farmers can never be considered a loss but a positive advantage to us all. No man who values our free institutions can for a moment doubt that no money expended among us produces in the end such gratifying results as that which is expended for education. Let us then have the experiment tried as to what can be done for the farmers of New-York. Let the means be provided to carry out the plan of the lamented Delafield, and then see whether New-York with all her pre-eminence will not be elevated still higher among the States of our Union.

His excellency the Governor of the State, in his message very properly called the attention of the Legislature to the importance of this subject, and we trust his recommendation will receive a favorable notice from the Legislature, as we think it so richly deserves.

The farmers hitherto have mainly relied upon their own resources rather than claim from government such aid as they might rightfully ask. But it is most gratifying to know that an increasing interest in this subject is apparent among the farmers of our State, and we trust that the enlightened liberality of the Legislature will afford such encouragement as may be necessary to secure an institution best adapted to promote this noble object; sure we are that no more acceptable contribution to the people of our State could emanate from the Legislature.

A resolution as to the location of the fairs permanently was presented at the last annual meeting to the Society, and the Executive committee in obedience to a resolution to send the same to the County societies requesting them to bring the same up for a decision, sent circulars to each county society, and as far as returns have been received they will be presented to the society.

In closing up the labors of the year the Executive committee are gratified in being enabled to congratulate the friends of agriculture with the successful results of the year. With union of effort among all who desire the advance of the cause in which all are interested, there can be no doubt that still higher attainments will be made from year to year. And while we do not pretend that everything has been done that might have been, we feel assured, that every effort on our part has been faithfully made to advance the cause entrusted to us, and we take leave of the Society in closing up our work, with an assurance of our undiminished interest in its welfare and with an ardent desire

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that its future progress shall be upward and onward until the very highest degree of excellence shall be attained in every department

The report of the treasurer will show the receipts and expenditures of the Society for the past year with a balance in the treasury of $2,968.69.

On behalf of the Executive Committee.

B. P. JOHNSON, *Corresponding Secretary.*

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REMARKS OF JUDGE CHEEVER,

PRESIDENT OF THE SOCIETY, ON INTRODUCING GOV. WRIGHT, OF INDIANA, TO THE AUDIENCE, FRIDAY, OCTOBER 5, 1855.

Ladies and gentlemen:—The success of this fair—the first held in the southern tier of counties—is a matter of congratulation, as well on the part of the people here, as of the Agricultural Society.

Some of the members of the Society and its friends, had doubts of our success if we held a fair here. They urged in support of their objections that the people of this part of the State had not, with but few exceptions, become members of the Society, or cared enough for it to contribute to its shows, or hardly to attend them; and that a feeling existed here, that had sometimes found utterance, that the Society was in the hands of a few persons along the river counties and on what is called the Central Line, who took to themselves all its management and all its benefits. To this it was answered, by those of us who had been here, that the people at large here had had no opportunity of seeing what we had done and what we were doing, and would think better of us after they had seen us; that it was a State institution, and every part of the State, so far as practicable, should have an opportunity to share in its exhibitions and in its benefits, and that we should have success if we came here.

We are most happy in coming, to find our highest expectations more than realized. We have been most generously and hospitably received. The village of Elmira and its neighborhood, mave met their part, in a most commendable manner, in the furnishing and preparation of the grounds, in carrying out the wishes of the Society, in putting up the structures with their necessary appointments, and tastefully arranging the more ornamental parts of the exhibition.

The local committee, under the efficient and well directed skill of their chairman, (Mr. Phillips,) deserves a high measure

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of commendation. He has arranged a place for every man and a man for every place, and each one has been faithful to his part.

Under the skill and taste of Colonel Frost, of Catharine, the fruit and floral departments have been so arranged as to produce a most attractive and imposing effect. To the fine contributions of fruit from the neighborhood, Col. Frost has added, from his own orchard and garden, collections which are choice in their character and very extensive in their number.

Elwanger & Barry, of Rochester, have contributed most liberally to our floral department and to our fruit tables, showing, among others, 170 varieties of choice pears. Frost and others, of Rochester, and Thorp, Smith, Hanchett & Co., of Syracuse, have contributed upon a scale, choice in its variety and ample in its numbers. We have to thank Pennsylvania, New-Jersey, and even Iowa, with other States for their contributions to this department, and especially are we indebted to Mr. Hovey, of Cambridge, (near Boston,) for coming nearly five hundred miles to place upon our stands, besides his other fruits, two hundred and ten varieties of pears.

This bringing together of fruits from points so remote, has furnished our pomologists with a valuable opportunity to note the effect of climate and location upon the same varieties.

To Mrs. Van Namee, of Rensselaer county, are we indebted for coming more than three hundred miles, and besides contributing largely to the domestic department, placing upon our stands, from her own garden and that of our old patron, Mr. Newcomb, more than one-third of the flowers which you have had the pleasure to look at.

The show, in the mechanical and implement department has not before been excelled. To the former are we indebted to Elmira for many interesting and valuable contributions.

The domestic department, that of household manufacturing, has not been as well sustained here as it should have been, not, it is presumed, because there is not an abundance to be found in these counties, but from the want of sufficient interest taken in the exhibition, or from a distrust in their success as competitors. But in needle-work, and others, showing artistic skill, and in some instances, genius, the exhibition has been highly creditable.

From the fertility of the soil and the quality of its grasses, this is one of the best grazing districts in the State. From this

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fact it was expected that our stalls would be filled with fine specimens of your cattle. They have not appeared in as large quantities as we looked for. We presume you have them; if not, you should. If you have them not, the means are now at your doors to provide them, and you ought not to let the fine animals here exhibited go from you until you have placed the means in your hands to produce them, so that at some early day hereafter, when another fair shall be held here, as it doubtless will be, you will be able, from the offspring, successfully to compete with the parents. One man remarked the other day that he would not bring his oxen here, because what was offered would not pay. That feeling I know does not extend far here. If it did agricultural societies would not last long. This Society has been brought to what it is, and is now able to make these exhibitions, from the gratuitous bestowment of much time, much labor, and much money, for a long series of years. We have cattle here, to-day, brought from Dutchess and Westchester, nearly 500 miles, (some of them not three weeks from the ship which brought them from Europe,) and cost more than half a thousand dollars each at home. They are brought here at much expense of time and labor, and at much risk of injury, not because the owners supposed it would pay, but that they might be looked at as an example, which our skill and our attention can imitate at home. These cattle will very likely take the small premiums we are able to give, because there are none brought in here to compete with them.

It is said as a reason why cattle have not been brought in from the neighborhood here to exhibit, that there is not much improved stock here. If not there should be. If its advantages are doubted let the doubting man place himself in the spring of the year at the ferry at Albany, when the droves of cattle from Ohio and Kentucky, pass on their way to the New-York and Boston markets. He will there see the steers from the Durham stock, taken to that country many years ago, by Mr. Clay and others, steers not four years old, whose backs are almost even with your eyes, with loins and hips so broad that a man may sleep upon them without danger of rolling off, even if he dreams; you may drive from your rich pastures the same stock, if you will place upon them the same blood

But, gentlemen, if you have not brought your cattle here you have brought almost everything else. It is very certain the people have come, and taken as a whole, we have had a fair

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that will compare most favorably with any one held since the society was formed.

One incident has occurred during our fair, which I refer to with great pleasure, one which points with great interest to the future. With our next neighbors here, who have come over from Pennsylvania and swelled our numbers by thousands, bringing with them their stock and everything else, to fill the place prepared for them or any body else, has come also,—His excellency, Governor Bigler, riding upon a train, freighted with Anthracite coal, the first that has passed directly from the mines over the Sunbury and Erie railroad, (of which he is president,) and over other roads to this place.

He has also carted over to our grounds here two huge lumps of coal, and presented them to this agricultural society, which we shall lay by as a remembrancer of the event. The delivery of this coal upon our southern frontier, nearly in the center of the southern line, to be distributed by the Chemung canal, reaching this point, and by diverse railroads diverging from it, to any part of our State, is a matter of the most flattering promise to us all, and most especially to our western and middle counties. The Governor accompanied this present with a speech of great beauty and fitness, and spoke of our ships, our agriculture, our iron and our canals, about which he supposed we felt pretty well; and added by way of being even with us, that Pennsylvania had something of the same to make her about our equal, and that she had her coal besides, which they would let us have, but expected pay for it; and that after taking some of our salt, plaster and barley, should expect the balance in cash. We can gather some hops with the barley, some hay from the Hudson valley for their horses in their collieries, a few hundred thousand dollars in brooms from the Mohawk; and if we are then short, which is doubtful, we can give the Bostonians some beef, pork, dairy and corn for some shoes, boots and clothes for the miners, and bring the balance upon the right side of the sheet. But the people of Pennsylvania may rest assured that whenever they come among us, either to make their commercial exchanges, or to mingle in our social circles, we will meet them with open hands and open hearts.

[The Judge then introduced Governor Wright, of Indiana to the audience who delivered the address.]

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ADDRESS OF HIS EXCELLENCY, JOSEPH A. WRIGHT, GOVERNOR OF THE STATE OF INDIANA; PRONOUNCED AT THE NEW-YORK AGRICULTURAL STATE FAIR, AT ELMIRA, OCTOBER 5, 1855.

Mr. President, and Gentlemen of the New-York Agricultural Society:—

"All flesh is grass," is a declaration of an inspired writer; the demonstration of which truth lies amid the plainest facts of nature. As the law of the grass is, that it "withereth, and the flower thereof fadeth," so, under the same law, exists everything which the grass produceth.

Of the soul of man—in the superiority and immortality of which we all believe—it is not my province, nor is this an occasion, to discourse. Considered simply in his material nature, produced, nourished, and reproduced, as that nature is, from the earth and its fruits, man is not a wanderer, who, after "prospecting" through the universe, has selected this beautiful farm of the earth for his residence and heritage. He is a part of it. In common with its other productions, vegetable and animal, he has risen from, and lives upon its bosom. He is the last born, the perfection of its fruits.

In common with the grasses, grains and fruits, upon which he subsists, he is subject to the law of dissolution and decay. "Dust thou art, and unto dust shalt thou return," is the law of the material man, as surely as it is the law of the soul that it shall return unto God who gave it:

"Each speed them to their source,"

returning to their respective treasuries the life and wealth which was loaned them.

Such, then, being the nature of our alliance with the earth, its cultivation becomes our first duty and necessity. It is the normal employment of man; and none other is so natural and honorable. The sweet instinct and the gentle purity of the suckling, nestling in the bosom of its mother, are but counterparts of the purity and dignity of the true and diligent cultivator of the earth.

In the prosecution of this work, we must understand, and act in conformity with the laws of nature. Science, in investigating and expounding these laws, appears nowhere more useful and graceful than as the hand-maid of the farmer. Concerning these laws, we can gather information from the history of the creation, in the first chapter of Genesis—a history as remarkable for its science as for its simplicity.

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At first, "the earth was without form and void; and darkness was upon the face of the deep." The elements of the earth were all there, rude and unshapen, upon the face of whose morasses and depths 'darkness' rested. There was no land—no water—no clouds, or fertilizing showers—no light—no firmament.

Now, how was order brought out of this chaos? And what was the first great agricultural result? The first command was, "Let there be light; and there was light." Thus, in order of creation was established that law which has ever since prevailed, making light a first and indispensable element in the productions of the earth.

In connection with this was established the law under which we find repose a necessary alternation to stimulus. The light nourishes and stimulates; darkness, therefore, precedes it, as a period of rest. "And God called the light *day;* and the darkness he called *night;* and the evening and the morning were the first day."

The next step in the process, was that which assigned to the heavens and the earth their separate powers of fertility. Light, evaporating the waters, held a portion in suspense, to descend, in due time, in fertilizing rains and showers. "And God said, let there be a firmament in the midst of the waters; and let it divide the waters from the waters." Then followed the separation of the land from the water; and "God called the dry land earth, and the gathering together of the waters called he seas."

Now all was in preparation for production and fertility; and, before the creation of man, or animated nature, "God said, *let the earth bring forth grass.*" Thus the pioneer settler, who now penetrates the vast forests which cover with "darkness" the soil he purposes to subdue, first, in conformity with the order of creation, says, "Let there be light;" and the sturdy stroke of the woodman repeats the command till the trees lie low, and the "light" greets the soil. The waters are exhaled by its kisses, and ascend above the firmament; the ditches are dug; and every throw of the busy spade says, "Let the waters under the heavens be gathered together in one place, and let the dry land appear," in order that the earth may bring forth grass.

Grass—grass—the great material which supports all flesh, and forms the material nature of man himself! Grass—the

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cultivation and perfection of which it becomes one of the first duties of the husbandman to promote!

Though this is the oldest command, and lies at the foundation of all agricultural wealth, yet, the subject to which it has relation receives from agriculturists less thought, less attention, less investigation, than is given by them to any other subject of rural interest.

Our zeal, industry, and wealth have been freely expended in the practical illustration of improved methods of cultivating grains, fruits and vegetables, and in the improvements of our stock, farming implements, and machinery. We have imported, at great expense, all kinds of domestic animals; our State fairs and our county fairs annually furnish reports, essays, and addresses, on every branch of agricultural industry; we have books and learned treatises on horses, cattle, sheep, swine, and even poultry; and many volumes of useful essays on cotton, wheat, corn, potatoes, fruits, rice, flax, hemp, and tobacco. All well enough; yet, at this day, we have not a book, report, or pamphlet, that furnishes the American farmer with even the *names* of the grasses of his country, to say nothing of that essential information which, by the tests of science, fixes the value of each kind, and determines the question of its adaptation to different soils, and to different sections of the United States.

The American farmer cultivates, or, to speak more correctly, he bestows some attention on the cultivation of ten or a dozen kinds of grass, while the teeming earth, without tillage, furnishes innumerable varieties of this staff of animal life, in all latitudes and longitudes throughout our wide spread country. No crop approaches so near a spontaneous, uncultivated yield, as the grass, and none pays so large a profit. While it is impossible for me to state, with precision, the annual value of this crop, I do not hesitate to express the opinion that, in this country, *the hay crop* alone, imperfect as it is, and receiving so little attention, is greater in value, at this day, than the combined crops of cotton, rice, and tobacco.

According to the census of 1840, the mere *hay crop* of the United States, was 10,248,108 tons; in 1850, it was 13,838,642 tons. I estimate the hay crop of 1855, at 15,000,000 tons, which, at ten dollars per ton, would amount to 150,000,000 dollars. The cotton crop of 1853, is valued at 128,000,000 dollars. Of the hay crop, more than one-half is produced by four States, to wit: New-York, Ohio, Indiana, and Illinois;

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your own State producing more than one-fourth of the whole; and yet no State has made this article a primary object of cultivation.

We treat the hay crop as one of minor importance. But little attention is paid to it: the meadow must wait till the other crops are disposed of; then the grass is cut, too often without any reference to its condition, or any well prepared place for its reception.

The value of the *hay* crop of this country, however, is not equal to the value of the grass crop appropriated to pasturage, even in the present unimproved condition of the latter crop. But if we make the values only equal, then the total value of the annual grass crop—hay and pasturage—of the United States, may be estimated at 300,000,000 dollars, or an amount equal to the aggregate value of all other agricultural products of our country, excepting wheat and corn.

I use the word "grass," not in its strict botanical signification; but, according to common usage, to designate the herbage or plants which constitute the food of cattle and other beasts.

Beginning with the few facts which are known in relation to the number and qualities of the grasses of this country, we should by means of scientific investigation and judicious experiments, endeavor to increase our knowledge, with respect to this great branch of agricultural interest. We find one kind of grass in this latitude, which it is said, is well adapted for making a sure crop of hay, and good pasture. It stands the drought well; is not much injured by rain in harvesting; forms a feeble sod; and is easily subdued when the meadow is to be transformed into a grain field. Another, elsewhere, that is suitable to wet prairies; less exhausting to the soil than the first; and is especially recommended for cultivation in the early settlement of a country, before a system of drainage can be effected. Another, said to be very productive, and exceedingly nutritious; and, when once well set, it forms a permanent sod; but it is slow in taking root, and will not stand our summer heat. Another which grows in tufts, and, in autumn, its leaves spread out most vigorously, for fall pasturage. Another, from its aromatic and astringent qualities is rendered agreeable to the palate of stock; it retains its verdure in the depth of winter, and, in the beginning of spring, it shoots forth with vigor. Another, with its rich long slender leaves, two feet in height, is seen in the fine uplands of the limestone region; in autumn it falls over,

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in thick windrows, matting the whole surface together, and retaining its freshness and nutritious qualities amid the frosts and snows of winter. Another, such as the grass which forms the celebrated pastures of the Swiss Alps, and those of the Tyrol, is peculiarly distinguished for possessing qualities favorable to the secretion of milk, and is, therefore, preferred for milch cows. Another, it is said, will endure cold and shade, without suffering injury. Another is only suitable for the light and heat of summer. Another, rich and nutritious, comes up after the crops are laid by, and affords fine crops of hay. Another, adapted to warm moist river bottoms, and, in some sections of our country, yielding five tons of hay per acre, is highly valued by some graziers. Another is found growing on dry, gravelly soils, and hill sides; and part of its value consists in the numerous seeds which are retained in the pod, long after they ripen—serving as food for beast and fowl.

"Grasses," said a distinguished philosopher, "are Nature's first care." They are the most general, extensive, and hardy, of the earth's productions. They are nearly of endless variety, and adapted to almost every climate. They endure the trampling of men and beasts, the browsing of cattle, the parching droughts of Summer, and the snows and ice of Winter; and spring into new and often more vigorous life, under influences which to other plants would prove destructive.

On mountain tops, where the warmth of the summer's sun is not sufficient to ripen their seeds, they live by their roots, and with thick clustering leaves protect these roots, producing thereby the densest and most beautiful verdure. And it is reported by one writer, that, for the preservation of the grasses in those localities where the ripening of their seeds is important, the wild beasts, guided by a remarkable instinct, leave untouched the stems that support the flowers. Do not the profusion of grasses with which the earth is clad, and the laws which so remarkably preserve them, indicate that they are worthy of the special attention and culture of those for whom the earth is ordered and established in fertility and beauty!

The farmer who understands the importance of bestowing careful attention upon his stock, diligently husbands the grasses and grains which furnish them with food and clothe them with flesh. But how little does he think of the fact that these very grasses should receive attention like that which he bestows on his cattle. Plants cannot live without food, more easily than

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the ox and sheep; and hence, there is a great sphere for study and care as to the kind of food which is adapted to the most perfect production of grasses; and there is a loud demand to protect them against injuries and depredations; but many a farmer will spend money and labor, in rendering his flocks secure from wild animals, and in protecting his granaries from the pilferings of vermin, and yet think little of the noxious influences and weeds that are steadily stealing from his grasses the food which nature has provided for them.

All plants receive more or less of their nutriment from the atmosphere; and for that purpose, are furnished with organs adapted to absorb aliment from light and moisture. These organs are found in their leaves, while the root is the portion that draws sustenance from the earth. The larger the leaves, the greater is the proportion of nutriment received from the atmosphere. Hence, grasses with *small leaves* exhaust the soil rapidly; whereas, the larger leaved varieties, like clover, drawing less from the soil and more from the atmosphere, are the best fertilizers—returning to the earth, when turned under, a larger percentage of fertilizing elements; and such grasses can, therefore, be successfully adapted to the culture of light lands which would entirely refuse to support other varieties.

I regard it as a well settled principle, that there are, in every country, indigenous plants which, when their qualities are fully understood, are precisely those which are designed by a beneficent Providence, to furnish the proper elements for the support of animal life. The same principle prevails in relation to soils, and their capacities to support vegetable life. Clay, sand, marl, and shell, lying in close proximity to each other, afford to the intelligent farmer or planter, the means of increasing and preserving the fertility of the land.

Although neither the number nor the names of our indigenous grasses have been ascertained, we cannot be ignorant of their great variety, richness and durability, when we look over our country, from the 49th degree of north latitude to the extreme south, and see the health, thrift, and superiority of our domestic stock, and the number and condition of the wild animals of our forests and prairies.

On the spurs and slopes of the Rocky mountains, and on the head waters of the Red river of the north, immense herds of buffalos subsist on a kind of grass which retains its freshness throughout the winter, and which remains green and nutritious

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while other grasses of the plains and valleys are dried up by the heat and drought of summer.

It appears, from the statements of botanists, that two hundred and fifteen varieties of herbaceous plants, commonly called grasses, are cultivated in Great Britain. Perhaps, in our own country, the student of Nature might find more than one-half of this number, growing spontaneously in the wild prairies which cover millions of acres. You may make your track through these immense plains, and by the side of your path, each year, there will spring up new varieties of plants and grasses. Where this wild grass is cut, or pastured, it brings forth, annually, finer, better, and different varieties, which are eagerly sought for, by the stock, while the other and wilder varieties are shunned. Who shall estimate the number of our grasses? Who shall classify them? And—what is a far more important question—who shall test them in the crucible of science, and determine their respective values, so that the practical farmer may, with certainty, avail himself of the advantages which will result from the cultivation of the best varieties?

Nature seems to indicate the propriety of sowing more than one kind of seed for meadows and pastures; as, in the natural herbage, we rarely find the whole surface of the soil occupied by one kind of plants. The earth produces almost an infinite variety of grasses, adapted to every conceivable kind of soil and location. The cold and bleak mountain sides, the arid sand plains, the alluvial bottom lands, the marshes and the bogs, are covered with various kinds of vegetation, each kind differing from others in its organic structure and qualities, and each requiring certain appropriate and peculiar elements for its support. The agriculturist who avails himself of his knowledge of these facts, may greatly increase the value of his meadows and pastures. Where as many stalks of one kind is produced as the soil is capable of supporting, another variety, that will take from the soil different elements, may grow between the first kind without interfering materially with it; as it is not a competitor for the same nutritious particles in the soil.

It is difficult to determine, with respect to any country, the proportion of meadow and pasture lands, as compared to the total quantity of land under cultivation. It is said that, in France, the meadows and pastures constitute about one-seventh of the cultivated lands: in England, about three-fourths. In the United States, the amount does not, probably, exceed one-

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third, even in the best grazing and hay-growing States; and, in many of the States, the number of acres used for meadows and pastures, does not amount to one-eighth of the total quantity of land under cultivation.

A general agricultural error is a national error—for the correction of which we must look to the agriculturists themselves. Some of this class of errors are especially worthy the consideration of some of the people of the United States. For instance, possessing, in favorable climates, a rich territory, ninety-five times as large as England, more than seventeen times as large as France, and more than twelve times as large as Germany, the people of the United States, overlooking and neglecting their own vast resources, import annually, millions of dollars' worth of an article, which, for its production, depends almost wholly upon grass.

The holding of land without improving it, is a public injury. In many portions of the country, immense tracts of land having been purchased at government prices for purposes of speculation, are owned and held by individuals who never intended to plant a tree, or turn a furrow on the soil. Such lands remain unimproved, checking the progress of improvements around them, and retarding the settlement and cultivation of many of the most fertile districts in the western and the south-western States.

In every part of our country, we have complaints in relation to the spontaneous growth of certain weeds and shrubs, which, if not eradicated, will invariably *injure*, and ultimately *take* the meadows and pastures. In certain districts where cattle, horses, mules, sheep, and other stock run and feed, it is known that there is a gradual increase of destructive weeds of various classes, depending upon the kind of stock pastured, and the character of the grass. What a field is here for experiment, investigation, and useful discovery!

Wherever there is found a large supply of lime in the soil, and a clay subsoil, grass will grow luxuriantly, and form a durable sod that will stand long-continued drought and excessively hot summers. The silurian hills on the borders of the western waters, and the mountain limestone regions are well adapted to the cultivation of grasses. But in these portions of our country, we find it difficult to compete successfully with the sandstone and drift formations in the cultivation of wheat, and other cereal grains. We cannot raise fifty bushels of wheat

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to the acre in the limestone region. Each portion of our country, however, has its own peculiar undeveloped elements of wealth; and the countless and increasing facilities which our oceans, lakes, rivers, canals, and railroads, afford for an interchange of our various staple productions, should induce the farmers and planters of the several States in the Union to study carefully the nature and qualities of the soil which they respectively cultivate. Those districts in which the cultivation and improvement of our indigenous grasses shall receive proper attention, may become the wealthiest portions of the republic.

We shall always find superior stock in those districts where the cultivation of grasses receives attention. Many demonstrations of this fact may be seen in our own country, as well as in Europe. Notwithstanding the large population of Great Britain, (who are mainly dependent on her commerce and manufactures,) she could not sustain herself, if she were compelled to import hay for her dairies and meat markets. There was a time in her history when she was dependent upon her mountains, and her neighbors, for her butter and meats. But, with her cultivation of grasses, her population has increased; and her stock, of every kind, has attained a degree of excellence which supports a demand for it in the markets of all countries.

In Holland, where the business of rearing cattle constitutes one of the principal sources of wealth, and where the price of landed property is high, a large portion of the surface of the country is devoted to pasturage and the cultivation of grasses. It is said, that the cultivation of *a single kind of grass*, in Jamaica, has increased, beyond computation, the value of the trade and commerce of that island.

Blue grass has done for Kentucky, what turnips have done for Flanders, and portions of England and Scotland—not only arrested the old process, which wore out the land, but restored the soil, and brought large profits to graziers.

Along the banks of the Merrimack, grass, that, fifty years ago, was considered as a great evil, has, within the last twenty years, been regarded as equal, if not superior, to any other variety for hay. Similar favorable changes have been made in the South, and in every portion of the country, where the attention of agriculturists has been directed to the subject.

A planter of Alabama, in a recent communication to the United States Patent office, says: "Our native, or spontaneous

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grasses, with proper care and attention, would prove an invaluable treasure. The experiments of Major Seymour Powell fully demonstrate the correctness of this impression, and prove most conclusively that the crop of crab-grass grown on a prairie field after the corn is laid by, if well saved, would be worth more than the corn. To test the matter, he measured several acres. Off the first acre he gathered thirty bushels of corn, which at the market price, 75 cents, brought $22.50. Off the same acre, he saved 2,675 pounds of nice hay, worth from $1 to $1.25 per cwt.—say $26.75. The second acre yielded 3,780 pounds hay, worth $37.80, and corn worth $28.40."

According to the statements of a distinguished florist and botanist, Mr. Prince, of Flushing, L. I., there are, in California, hundreds of species of trees, shrubs, herbaceous and bulbous flowering plants, indigenous to that region, which are totally distinct from those found in other parts of the globe, many of them being "entirely new to the botanic world." Mr. Prince says, "In bulbous flowers, this country [California] is particularly rich, and many of them are of great beauty and interest, and particularly striking. The balsamic character of very many of the *herbaceous plants* forms a peculiar feature in that class."

Some friends of agriculture are making efforts to improve our grasses, by the introduction of foreign varieties. Many of the English grasses are hardy and very nutricious. They might not endure our climate. But, on the other hand, it is possible that a change of climate would result in an improvement of the good qualities of a good grass.

It will, however, be time enough to make experiments upon foreign grasses when we shall have learned something more of our own. Within the boundaries of our vast national domain, in various latitudes, climates, soils, and situations, we have, I doubt not, more different kinds of grass than are found in any other portion of the globe, and yet the number which we cultivate does not exceed twenty.

We should learn to appreciate the beauty, improve the growth, and increase the value of the indigenous trees, plants and grasses of the United States. Leaving out of view the error of useless pecuniary expenditure, and regarding the subject as merely one of taste, I am inclined to believe that we have injured the appearance of many a large mansion, and marred the picturesque beauty of many an humble *home*, in attempting, by the importation of shrubs and grasses, to imitate the landscape

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gardening and the rural scenery of other countries. The native garniture of our own forests, fields, meadows and pastures, when modified and improved by our own hands, directed by a cultivated taste, will be sufficient to enrich, adorn and beautify our land.

These remarks are made, not with the conviction that I am offering any new facts for the consideration of good farmers, but with the hope of inciting the agriculturists of the country to look with special interest into the subject of our native grasses. This subject has not received, nor does it now receive, that degree of public attention which it deserves.

We sow two or three kinds of grass seeds. Nature gives us numerous varieties of those which arrive at perfection, in different latitudes of our country, during each successive month, from spring to autumn, yet we are ignorant of the qualities of the grasses which grow spontaneously in our common pastures, and we know but little of the weeds which injure and destroy them.

Some time ago, in the course of a scientific examination, twenty-two species of grass were found on a single square foot of a rich ancient pasture in England. Recently in a western State, by means of the enterprise and industry of one lady, specimens of seventy-five kinds of grass were found, and presented as a *bouquet*, at an annual State fair.

The worst of all depredations are those which ignorant and reckless men commit on their mother earth—the source and support of organic life—when they destroy or impair the fertility of the land, either by their ignorance or by their neglect of the means by which it may be improved and preserved. It is our duty to leave the earth in a condition as good at least as it was when we found it.

In many parts of our country the people seem to believe that the earth is possessed of a constitution so strong, so stout, and so healthy, that no extreme of bad usage can affect it injuriously; but Time, the great instructor, is demonstrating our folly, and warning us to change our modes of farming. While the husbandman carries forward his works of agricultural improvement, he must not forget the injunction, "Let the earth bring forth grass." If, disregarding this mandate, he shall continue to neglect the investigation and cultivation of grasses, the annual depreciation of his crops of corn, and other grains, will, ultimately, qualify him to appreciate fully the force of the

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Belgian maxim, "*No grass, no stock; no stock, no manure; no manure, no crops.*"

In no one thing does the ignorance of the laws of nature, so common among farmers, manifest itself so plainly as in the panic that spreads like an epidemic over the whole country, when the crops are threatened with any of the thousand casualties incident, not to agricultural pursuits only, but to every other human avocation. The merchant and the banker see a financial crisis approaching, and, understanding the laws of commerce and trade, deliberately prepare to meet what they cannot avert, without the murmuring and croaking that fills all the land when the crops are in danger. This disposition to complain about failures in the crops not only betrays ignorance, but it exhibits an almost impious want of confidence in the wisdom and beneficence of that over-ruling Power that "shapes all our ends, rough-hew them as we will."

We may justly complain of the oppressions of human governments, of the wrongs and outrages of society, of "man's inhumanity to man;" we may murmur over hard times, and financial embarrassments, but we should look upon the thousand ills that, in threatening aspect, stand around all the productions of the soil, as so many friendly rebukes from a kind Providence, reminding us of our ignorance of the natural laws on which these things depend.

In the severe drought of last fall, that blighted the hopes of the husbandman throughout the greater part of the north-western states, when the croaking of ruined crops had attained its highest point, a close observer could not fail to see, here and there, a field green and luxuriant in the midst of surrounding desolation. If you stopped to inquire into the cause, and asked for an explanation, you would learn that no special showers had visited those favored fields, but that they had been sub-soiled, or deeply plowed, well stirred and kept in a condition to absorb all the moisture afloat in the atmosphere, which compensated for the showers that came not. Instead, then, of repining, we should profit by the lesson, and *go and do likewise.*

On the first and second days of June last, portions of Indiana were visited by severe and destructive frosts; a few days afterwards the farmers might be seen in anxious groups, with long faces, exhibiting specimens of their ruined crops, with all the evidences of despair over the gloomy future. But, on visiting the fields, you would find that the injury to the wheat

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was confined to that which was in bloom; the Mediterranean and early Alabama varieties, many fields of which were then in full flower, were injured, while the great body of the crop, consisting of other and late varieties, wholly escaped, and we had more than an average crop, after all the panic. From this, let us learn the lesson, that early wheat is in danger of frost, even on the 40th degree of latitude.

In low moist grounds, the cornfields suffered severely, while the corn in more elevated and better drained land was uninjured. The undrained ground was cooled down, by evaporation, even to the freezing point, while the absorbed rays of yesterday's sun kept the drier soil at a temperature above injury. *Drain, drain, drain*, was the voice of this friendly admonition from Providence, and we should receive all such admonitions with thanksgiving, instead of croaking.

The mandate that requires man to "eat bread in the sweat of his brow," contemplates the subjecting of men to a schooling, a discipline that shall qualify them to contend successfully against the great and numerous difficulties which arise in their paths through life. It is not the lot of the tiller of the soil, to struggle against ordinary foes. He finds giants by the wayside of life. He must contend with the elements of earth and air, Snows, storms, frosts, hail, and even rains, dews, and the blessed sunshine, are his enemies while he remains in ignorance of their influences. He who wages a warfare with the elements of earth and air, in order to compel them to deliver up to him their rich treasures, will without doubt or question, suffer a defeat disastrous in proportion to his ignorance of the laws by which his adversaries are governed. But the farmer who understands these laws, will be able under the favor of heaven, not only to bring forth treasure from the earth, annually, but to explain the means by which he accomplishes his great work.

He studies the nature, condition, and quality of his lands; and his fields are *improved*, not *exhausted*, by cultivation. His knowledge, experience and judgment, enable him to adapt the crop to the soil, or to prepare the soil for the crop. He reasons, he reads, he reflects, he makes experiments, and he discovers new methods of overcoming old obstacles.

In this great work, we want, for leaders, men whose examples and precepts will excite the enthusiasm, and win the confidence

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of their fellow-laborers in the field of agriculture. In every farming district, throughout the vast extent of our fertile domain, *we want more men* qualified by their knowledge, their experience, their skill, and their enterprise, to instruct and encourage their fellow-men in the task of "subduing the land." When we shall have the whole body of our practical farmers engaged, not merely physically, but mentally, in illustrating the power, beneficence, and dignity of the science of agriculture, the "*wilderness* and the solitary places *shall be glad of them;* and the desert shall rejoice and blossom as the rose."

According to the census of 1850, one-eighth of our entire population live in cities whose population is over ten thousand; and at least one-fifth of the whole population are residing in towns, villages, and cities. Taking into view the extent of our territory, the sparseness of our population to the square mile, the cheapness and fertility of our lands, and the facilities for exchanging all commodities, and productions of skill and industry, I do not believe that the history of the world shows an instance in which the people of a civilized nation exhibited such a preference for city and village life.

When our population shall become two hundred millions, one-half of the people will be crowded in cities, towns, and villages—unless the popular sentiment of the nation, after overcoming the general aversion to manual labor, and subduing the hot thirst for professional and mercantile pursuits, shall awaken in the American mind a strong love for rural life. The present condition of our country is well described by the poet:—

> "Trade wields the sword; and Agriculture leaves
> Her half turned furrows; other harvests fire
> An avarice of renown."

The object of these associations, in our townships, counties, and States, is not solely to enable the farmer to improve his stock, and increase his products. This end is highly important, and very desirable; but it is not one which should absorb all others. Man has a moral nature, of vastly greater value than his material and physical one. The increase of material wealth and prosperity, without a proportional increase of morals and intelligence, is not merely of doubtful advantage—it may justly be regarded as a *curse* rather than a blessing.

It is wisely ordered, therefore, that in order to attain to the greatest degree of material prosperity, learning and science must be united with muscular labor and material economy. The man whose life is devoted to the sciences, though understand-

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ing, by the analysis of the laboratory, the economy of plants, soils, and animal life, may prove a very poor practical farmer; while the farmer who despises "*book-learning*," will fall far behind his wiser neighbor, who seeks to blend with practical skill the discoveries and suggestions of the man of science.

It is on occasions, and at places, like the present, that hints and suggestions should be freely given and received, which may lead to the most successful blending of speculative discoveries with practical knowledge. One great object of these assemblages, should, therefore, be to diffuse general intelligence and scientific truths among agricultural communities; thereby aiding, not only in the increase of their material thrift, but in the development of the mighty resources of the earth.

Another class of subjects should not be overlooked; I allude to the connection between enlightened agriculture and the development of the social and moral nature of man; the connection between agriculture and independence—between agriculture and the sacredness of the domestic relations and endearments—between agriculture and the recognition of that Providence upon whose care the farmer, more than any other man, should, from the nature of his pursuits, rely.

The tendency of agricultural pursuits is to give distinctness and strength to *home* associations and influences. The greater communities are made up of the smaller; and as a community increases in magnitude, it decreases in its local power and influences. At the base of all lies the divinely appointed institution of the *family*, where the greatest power is concentrated in the hands of the father, who is the patriarch, legislator, judge and executive of his household estate. Living on his own domain, with his woodlands, pastures, meadows, hills and streams about him, he is supreme, with only those few and necessary limitations which the larger community throws around him. It is here that the influence of woman—man's first, last, best comforter on earth—is felt and recognized. It is here that "she openeth her mouth with wisdom, and in her tongue is the law of kindness." It is here that "she looketh well to her household, and eateth not the bread of idleness." It was *at home* that King Lemuel learned the good and wise "*words that his mother taught him*." Mother! The sweetest word in all the babbling languages of men! It is the mission of woman—it is the holy mission of the mother—to impress upon the young mind the first lessons of truth, virtue, wisdom and courage. Her empire

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is in the affections of her husband and children, who "arise up and call her blessed."

On the right regulation of these independent *households* depends the welfare of smaller ones. And, so far as the influences of these associations and fairs are calculated to ennoble, dignify and enrich the occupation of the farmer, just so far will they tend to increase the attractiveness, and the wholesome influences of his home, making him and the members of his household better citizens of the larger communities.

The *family* being a divine institution, the sentiment and the affection upon which it is based are innate in man. Hence its universality. No merely human institution, however perfect, can ever take its place. Directly or indirectly, almost all great and good men have been indebted, for their beneficent power and influence, to the early teachings of parents, and the genial nurture of *home*. Above all nations, *we* should cherish the family relation. The influence of *home* was the inspiration that swelled the great hearts of our fathers for the struggle which has given freedom to their sons, and we will fail to transmit the boon to our descendants if we enlist not for its preservation the helps by which it was originally won. If all homes could be made pleasant, and all family relations fraternal, kind and pure, society would lose its hypocrisy and guile, and mankind, actuated by true Christian charity, would move steadily on, from triumph to triumph, towards the perfection of the intellectual and moral nature of man.

That spirit of inquiry, investigation and enterprise that has been awakened at your township, county and State fairs, by competition for premiums on household fabrics, and on products of the dairy, the farm and the shop, may justly be regarded as a link in the chain of *home education;* and this is a very proper direction for things to take at this period in our history.

At the base of the prosperity of any people lies this great principle—*make labor fashionable at home.* Educate, instruct, encourage; and offer all the incentives you can offer, to give interest and dignity to labor *at home.* Enlist the heart and the intellect of the *family* in the support of a domestic system that will make labor attractive at the homestead. By means of the powerful influences of early home education, endeavor to invest practical labor with an interest that will cheer the heart of each member of the family, and thereby you will give to

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your household the grace, peace, refinement and attraction which God designed a *home* should possess.

The truth is, we must *talk* more, *think* more, *work* more, and *act* more, in reference to questions relating to *home*.

The training and improvement of the physical, intellectual, social and moral powers and sentiments of the youth of our country, requires something more than the school-house, academy, college and university. The young mind should receive judicious training in the field, in the garden, in the barn, in the workshop, in the parlor, in the kitchen—in a word, around the hearthstone at *home*.

Whatever intellectual attainments your son may have acquired, he is unfit to go forth into society if he has not had thrown around him the genial and purifying influences of parents, sisters, brothers, and the *man-saving* influence of the family government. The nation must look for virtue, wisdom, and strength, to the education that controls and shapes the *home policy* of the family circle. There can be no love of country where there is no love of home. Patriotism, true and genuine, the only kind worthy of the name, derives its mighty strength from fountains that gush out around the hearthstone; and those who forget to cherish the household interests, will soon learn to look with indifference upon the interests of their common country.

We must cultivate the roots—not the tops. We must make the *family government*, the school, the farm, the church, the shop, the agricultural fairs, the laboratories of our future greatness. We must educate our sons to be farmers, artizans, architects, engineers, geologists, botanists, chemists—in a word, practical men. Their eyes must be turned from Washington to their States, counties, townships, districts, *homes*. This is true patriotism; and the only patriotism that will perpetually preserve the nation.

With a territory stretching from the Atlantic to the Pacific, and with sea coasts more than five thousand miles in extent, we have almost all varieties of soils, climates, and productions; and, consequently, we have within our boundaries, citizens of every kind of pursuit and occupation. The world never witnessed, before the present time, such a busy, bustling, energetic crowd of human beings, scattered over a territory so vast, and living under a government supported by their own will. Farmers and planters, mechanics and manufacturers, merchants

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and traders, miners of iron, and gold, and silver, and copper, and coal; men of labor and industry, engaged in business in town and country, on the oceans of the world, and on our lakes and rivers—all of these, while they constitute the strength of our confederacy, have, in their various pursuits, their own peculiar customs, habits, manners and tastes; yet, their constitutions and their laws protect their rights, *individually*, and recognize their political equality. In this consists the strength and the beauty of our form of government.

We require, we must have the full grown policy of each of these pursuits, with the thousands of others that will naturally arise in a government whose interests are so diversified—each of these should be left free to arrive at full perfection, without the influence of a great, overshadowing, central, consolidated government.

A great proverbial economist has said, "Take care of the pence and the pounds will take care of themselves." We may, with a slight modification, apply the proverb to government. Let us take care of the smaller communities, and the larger will take care of themselves. I recently asked a friend of mine, an intelligent farmer, "For whom did you vote for township trustee?" "Well, really, I have forgotten;" was his answer. "Forgotten!" I replied, "Forgotten! What! Do you not know the man to whom you have entrusted the management of affairs most intimately connected with the moral and intellectual welfare of your children? Do you forget the person who is to have charge of your schools, and to choose teachers for the future men and women of your country? Why, my dear sir, never be so forgetful again. Hereafter select the most useful and intelligent man in your township for trustee; and never forget the choice you make. After this, select the best man for county commissioner, to direct your municipal government. If you have another great man, send him to the legislature, to speak your voice in framing laws to protect your person, property and character while you live, and the rights of your widow and children when you shall be no more. Then, if your catalogue of great men is exhausted, but you have one left with about half sense, send *him* to Congress."

This advice was given from a full conviction of its correctness. How can you expect the heart of this republic to be free from corruption and fraud, when the little streams and rivulets which nourish it are neglected? The fountain heads and springs

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of this nation—the people of the several states and territories—in their primary organizations, in their local policy, laws, customs, and manners—are the sources from which the national government must derive, politically, whatever of virtue, wisdom, or strength it may possess.

It has been justly said, that the two great leading objects of human pursuit are agriculture and mechanism. In these are comprehended the wealth of the country. Their prosperity indicates the prosperity of the nation.

We have too long regarded as the wise man, the representative who devises the best system of finance, to carry forward great enterprises by borrowing millions. Suppose we establish a new standard by which to measure men, and regard him as the wise man who devises a system that will support and advance the true interests of agriculture, mechanical and manufacturing pursuits. He who is a good model farmer, is as much entitled to distinction and office, as is the man who has commanded a regiment in battle. He who shall ascertain the cause of the potato rot, and prescribe a preventive, will be as much entitled to the respect and thanks of his fellow-men, as he who may manage the finances of a bank successfully. The country will not be retrograding when the highest office shall be given to the mechanic or the manufacturer, who shall make the best specimen of mechanism, or the finest piece of cloth. Let the friends of the *plow*, the *loom* and the *anvil* have their associations, conventions, shows and fairs. These are the *great universities* of practical, agricultural and mechanical knowledge.

How limited is our knowledge of the chemical properties of the air that we breathe, of the water that we drink, or of the soil on which we are dependent for the food that supports life! How ignorant we are of the various natures and qualities of the different ores and minerals that lie in profusion all around us! What do the students in our colleges and universities learn of the botanical characteristics of our grasses, grains, fruits, trees and flowers? And, on their return to their homes, what information can they communicate to their neighbors, in relation to the physiological peculiarities of those animals for which there is, in the market and on the farm, the greatest demand?

The progress of a happy change is visible in every part of our country. During the course of the present year one-fourth of the whole nation will have assembled at our numerous State and county fairs, and the most favorable results will follow

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these exhibitions of the enterprise, skill and industry of the people.

In many parts of the Union the people are organizing agricultural schools and colleges, in which the science of planting and cultivating will be taught in place of human butchery. The schoolmaster is beginning to be regarded as one whose profession is as noble as that of the buttoned gentleman. The public mind seems to have awakened to the realization of something practical. Each man is asking for himself information with respect to the *best system*, *the best mode*, *the best manner*, of reaping the reward of labor bestowed upon the earth, or in the making of those articles which are found necessary for his comfort and condition in life. In the investigation of these questions, men are willing to exchange views and opinions with their neighbors. They are not only willing, but anxious, to become acquainted, by personal observation, with modes of labor, machinery, and the productions of the earth; in a word, to have the full history of all that is around them.

The mechanic has access to the farmer—the farmer to the mechanic; they meet and consult together. At these exhibitions the most distinguished mechanics are present, and they bring with them not only the work of their brains and hands, but active and observing minds, to inquire into the wants of the country, and they return to their workshops to perfect the inventions that have been suggested by these means. The farmer too has a favorable opportunity at these fairs to make himself well acquainted with what is new and useful, and to see the best productions of different portions of the country.

Perhaps the most convincing evidence of recent great improvements in the business of farming will appear on instituting a comparison between the present condition of the agricultural interests of your State, and that condition in which these interests existed before the organization of these associations. There are, I doubt not, those present who, if they will look back over a period of twenty-five years, can make the comparison to which I refer.

In the lapse of that time, what improved modes of cultivating various soils have been discovered and adopted by the farmers of New-York! How many new kinds of agricultural implements have been brought into profitable use! How many farmers would now be willing to go back to the use of the old farming implements and the old method of farming? How

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many new varieties of grains, fruits and vegetables have been introduced, to increase the value of your crops! What changes have taken place with respect to the number and value of your breeds of cattle, horses, sheep, swine and poultry! What improvements have been made in the management and value of your dairies! What is the value of the stimulus that has been imparted to your home industry by the encouragement which agricultural associations have given to the manufacture of household fabrics, and other articles of domestic production!

The men of labor of this nation are under an obligation to regard the State of New-York as a national benefactor. We have the fruits of the genius and perseverance of your Fulton and Clinton, and the influence of the example of your distinguished son, the lamented Silas Wright, whose days were devoted to the cause of labor, and who, in his life, presented a model worthy of all imitation, of a high-minded, far-seeing statesman, an upright and an honest man. His name and fame are the common property of the nation. We have, too, the example and the results of your State agricultural organization, which, for a quarter of a century, by its transactions, reports and fairs, has been giving information and encouragement to the men of toil in every portion of the country. And this day we see before us some of the richest trophies of your noble enterprise.

Citizens of the State of New-York, you cannot avoid receiving encomiums and encouragement while you continue to prosecute this work of State and national improvement. You have among your visitors to-day citizens from more than twenty States of the Union—from the south, north, east and west. There cannot be any just cause of jealousy, dissention or hostility among the friends of American labor and enterprise, in the various sections of the country. They are bound together by every motive and consideration which can influence the hearts of men to preserve the peace, promote the harmony, and advance the prosperity of their common country. A great chain of twenty-five State fairs, and more than a thousand annual county fairs, while supporting and imparting strength to the industrial interests of the nation, will have a natural tendency to exclude sectional prejudices, and to bind us together in national harmony and brotherly love.

The present national greatness of the United States is mainly attributable to two obvious principles—the influence of *law*

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upon our citizens, and their attachments to their own municipal and local governments. Just in proportion as we have departed from the strictest observance of law, and looked abroad into the domestic institutions of our neighbors, have we been led into difficulties and trials. There is no higher duty of the citizen than to maintain by word, deed and action the absolute supremacy of the law. We should bear in mind this great truth, that the first public act of disobedience to the law is the first fatal step in the downward road to anarchy.

Let the American citizen discharge faithfully, not only his national obligations, but his public and private local duties. This can be done in the most effective manner by guarding against the slightest encroachments upon the compact which makes us one people; by a strict observance of law; and by a true discharge of those essential, religious, political and social duties which lie at the foundations of society. Let us, like our fathers, be watchful and faithful—at the fireside, on the farm, in the school district, in the township, in the county, in the State. Let us establish and maintain good morals. Let us encourage the growth of the arts and sciences, and all branches of useful industry. Let us continue our efforts to advance the agricultural, mechanical and manufacturing interests of the Union. And, finally, let us teach the rising generation to love their whole country, and all parts of it, especially their own hearth-stones—*their own homes*.

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THE DAIRY.

CHEESE AND CHEESE MAKING.

The annexed questions were presented to cheese manufacturers at the fair at Elmira, and the statement of Hon. G. Denniston, of Prattsburgh, Steuben county, contains very full and valuable suggestions as to cheese making, and embodies the substance of the answers of the competitors.

Those who present cheese for the premiums offered, are desired to answer in detail the following questions:

1st. Do you warm all the milk at all seasons in the year or not—and why?

2d. At what degree of heat do you set, or add rennet—and why?

3d. Do you vary the heat at setting at different seasons of the year—and why?

4th. What kind of rennet do you use; how prepared; by what rule do you judge of the proper time to commence breaking the curd—and why?

5th. How do you break or make the curd fine—and why?

6th. Do you observe a rule as to the time occupied in breaking the curd—and what is it?

7th. Do you observe a rule as to the age of the curd when you begin to heat up to scald, and the time occupied in raising the heat—and why?

8th. How do you apply heat in scalding; what degree is used, and how long kept applied to the curd to cook it enough?

9th. Do you vary your rule in scalding at different seasons in the year—and why?

10th. How do you determine when curd is scalded enough?

11th. How do you separate the whey and curd, and what rule have you for tempering the curd for receiving the salt?

12th. What kind of salt used; how much, and how do you apply it, and at what particular state of the curd?

13th. How soon after applying the salt do you put the curd to press; warm or cold—and why?

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14th. What power do you press with, and how long?

15th. What is the cause of the pressing cloth adhering to the cheese, and what is your remedy?

16th. How do you give coloring to the cheese, inside or outside?

17th. How do you produce a rind impervious to flies?

18th. What kind of oil or dressing is used upon your cheese, and how is it applied?

19th. What is the cause of cheese swelling, and what is a remedy?

20th. Do you use the thermometer to test the degree of heat?

....

Hon. G. DENNISTON, *Prattsburgh, Steuben County.*

The manufacture of cheese is of very ancient date. It is alluded to in the history of the Assyrians, the Jews, Greeks and Romans. It is hinted in "*Fuller's Worthies*" that the ancient British had no skill in the making of cheese, till taught by the Romans; but that they had so improved the manufacture that the Romans may even learn of them.

In the *process* of cheese making, scarcely any two districts of country pursue the same course, or produce an article identical in taste and appearance. Cheese is manufactured from the richest milk, as also from every quality down to skim milk, and consequently, the article is produced varying from the richest down to such as are dry, hard and horny.

These various grades of cheese exist in our country without any particular nomenclature to distinguish them; but in England they are designated by *names*, which, first originating from districts of the country, have gradually become the distinguishing marks of the article, rather than of the place where it is made.

The county of Cheshire (England), in olden time, was famed for its cheese, for "*quantity and quality*," and it is said that people in other places "essayed in vain to make the like," and failing, to do so, the idea obtained that there was something in the soil of Cheshire, not to be found elsewhere, favorable to the production of good cheese.

In Leicestershire, (England,) at Stilton, a cheese was for a long time manufactured of such reputed richness as to sell for half a crown per pound. Its manufacture was for a time confined to certain persons residing near the "Old Bell Inn," Stilton, and its peculiar qualities resulted from the rich milk used.

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and mode of manufacture. This being adopted by dairymen elsewhere, the same quality of cheese was produced in other parts of England, commanding equal prices.

It is well to notice those kinds of cheese that are deemed the most valuable in the English market, and also the process of their manufacture, as, by it, we may obtain valuable suggestions which may advance the standard of our cheese, and enhance its price in the domestic and foreign markets.

As *cheese* is manufactured from *milk*, it is important that the dairyman have some knowledge of its constituents and the changes effecting them relatively, and individually through surrounding causes. When milk stands for a time it is seen to separate into two parts—what is called cream rising on the surface, and a watery fluid resting beneath. *This latter* by standing will again change; it first becomes *acescent*, and then *coagulates*, which upon being pressed, a "*serous*" fluid is forced out, leaving the "*caseous*" portion, or what is called cheese

From the "*serous*" portion, by being slowly evaporated, will be deposited sugar, muriates of potash and soda, and phosphate of lime. It also contains "gelatine."

The manufacture of cheese consists in the complete separation of the curd from the whey, and in the proper compressing and curing of the curd. There are leading principles, that should be noticed, relating to every stage, and which will determine the flavor, and texture of the article produced.

1. The evening and mornings milk is used—the evening milk is strained into a tub, and, in the morning, added to the mornings milk. The temperature of the milk united will be generally so low as to require more warmth; this is done *at all seasons of the year* by putting the milk into a tin vessel, which is floated in heated water. It is important to determine the exact temperature at which the milk should be "*set*." Some advocate a low temperature; but experience has indicated that from 84 to 90 deg. is about the range at which the milk ought to be coagulated.

2. I have noticed that the higher the temperature of the milk at the time of setting, the sooner it will coagulate, but the curd will be tougher and less in quantity; and on the other hand, if the milk be set at a very low temperature, the curd will be longer forming, will be greater in quantity and more tender in quality. The range of temperature, as I have before stated, is from 84 to 90 deg. according to the season and the weather.

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3. It is found necessary to *vary the heat* at setting, at different seasons of the year, so as to produce coagulation within a given time, for if the temperature should be too great in warm weather, the curd will form tough and hard, and if it be too low, in cool weather, it will form too soft, will work off with the whey, and reduce the quantity, as well as the quality of the cheese. The *precise heat* at which the milk ought to be set, is important in cheese-making, and should be determined by careful observation of those engaged in its manufacture.

4. The *rennet* used is *calf rennet*. It is prepared by turning out the contents, and every other impurity. It is turned inside out, stretched on a stick, salted and hung up to dry. When thoroughly dried, it is packed in salt and put in a dry place. The rennet is used by steeping a small piece in a cup of luke-warm water, adding thereto a little salt. I judge of the proper time for breaking the curd by pressing the surface of the milk, and if the *curd*, and *whey* appear *distinct*, the one coagulated and solid, the other of a pale green shade, it indicates the curd is in a condition to separate from the whey and to become fine and smooth in breaking; but if the curd appears *soft*, it is not sufficiently formed for separation from the whey and for breaking.

5. The curd is broken by means of a "*cheese cutter*" formed of wire-work, which is passed through the curd perpendicularly and in different directions so as to separate it into small and equal parts. The finer the curd is broken the sooner it will separate from the whey.

6. The time occupied in breaking the curd is determined by the state of the curd and the whey. The curd must be in a condition to be worked even, so that, in the *after scalding process*, no element of fermentation remain in it to depreciate its quality. The curd must also be in a condition to separate from the whey, which it does by sinking. It is essential at this point to notice, as before hinted, that the curd be not too *tender* through a low temperature, nor too tough by being too warm The proper temperature is to be observed as conducive to a proper condition of the curd in its texture and firmness. This being observed and secured the breaking process need occupy no longer time than is necessary to separate the curd into fine and uniform parts. so that it may gradually separate from the whey.

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7. As soon as the curd has settled, and the whey appears clear on the top, begin to dip the whey off, and to scald. The time for raising the heat will vary according to circumstances from *three quarters of an hour* and more to be determined by the condition of the curd; if it is hard, not so long, if soft, longer, to work it harder.

8. The heat is applied in scalding the curd faster or slower according to the action of the rennet, as that acts rapidly or less so. The practice is to raise the temperature gradually from that of the curd, when broken, up to 90 and from that to 106 deg. and while scalding, the whey and curd is kept in motion to keep the curd from running together, and that it may be equally cooked throughout; the *time* taken varies from half to three-quarters of an hour, and sometimes longer.

9. The rule is varied somewhat at different seasons of the year, as the temperature is cold or warm. In warm weather do not raise the scalding point as high, in cold, higher. Although the particular principle applicable to the scalding process is admitted, yet the application is to be determined by circumstances. The changes of the weather, and the particular state of the curd, (must in all cases be strictly observed,) will indicate to the observing mind the variations from the rules that are necessary to result in a good cheese.

10. The test, by which it is determined, that the curd has been *cooked enough*, is that it will feel *elastic*, and when chewed between the teeth will *squeak*. This is a simple test, and if applied with discrimination and judgment, it is an infallible one; and yet many mistake the condition of the curd, by not cooking it enough, or too much, and the consequence is that it is either too stubborn and tough, or not sufficiently so, to be in a proper condition for its after-working and manufacture.

11. As soon as the curd is sufficiently cooked, it is then separated from the whey. This is done by dipping it on to a strainer, spread over a tub or sink. It is necessary to be very particular at this stage of the process—if the curd is too hot, and matts together, its temperature should be reduced by turning on cold whey until it sinks to 94 deg.; at this point the curd will absorb the salt freely, and afterwards press out freely.

12. The salt used is *the first quality of Onondaga salt*, and *one pound* of salt to *forty pounds* of curd. In the cool weather of spring and autumn, one pound to fifty pounds of curd. The curd is salted when warm, and well drained. It

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must be worked fine so as to work the salt uniformly throughout the mass. During the salting process the temperature should range from 94 down to 75 deg.

13. As soon as the salt is thoroughly worked in, and packed for a few minutes, until the curd sinks in temperature to about 72 deg. it should then be put to press. If it be put to press at a higher temperature it will be tough and strong—if at a lower, it will crumble, and not press well together.

14. The power with which the cheese is pressed is the "*improved Ohio press*," and varies from three to ten tons weight, according to the size of the cheese. The cheese is pressed twelve hours and then turned, and then pressed twelve hours longer. Sometimes when the cheese is large, it is pressed in all forty-eight hours.

15. If the cheese is put to press *too warm*, or the curd is soured, or the *cheese cloth* not perfectly *clean* the *cloth* will "*adhere to the cheese.*" The remedy is indicated by the cause.

16. The coloring matter used is "*annatto*," and is incorporated with the rennet, and applied in setting the milk with the rennet.

17. After the cheese is taken from the press, it should be cleared of all blotches or scum that may arise on its surface, and sufficient oil and some beeswax rubbed on to keep it from cracking. This being observed *strictly from day to day*, a *rind* will be produced that will be impervious to flies.

18. The cheese is rubbed with *whey oil*. The whey stands until a cream rises upon its surface, which is skimmed off, and *churned*. The milk is worked from the butter and it is then tried down, until all the milk and watery particles escape, to what is called *whey oil*. This oil is rubbed on the cheese *quite warm*, and thoroughly rubbed over its surface. Be sure to rub no more oil on, than will become incorporated *readily* with the rind.

19. A cheese that has been neglected in the scalding process, or that has not been sufficiently salted, or the curd of which has been improperly worked will likely *swell*. As has been before hinted, the *process* of *setting*, of *scalding*, of *salting*, must be particularly noticed, or the cheese will present some feature which will detract from its value.

20. A thermometer is used to test the degree of heat in all cases; and yet its use must, in all cases, be guided by observation, as contingencies arise that produce chemical changes.

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The thermometer is a *mere instrument* to be called in aid of a practical judgment, and careful discrimination, rather than an absolute rule, by which we are to be governed. There exists a *range of essentials* throughout the whole process of cheese manufacture, and at the same time a *difference in the minutiæ*, which is to be determined by observation.

MACHINERY.

The committee on machinery and implements, to whom were referred the articles entered for competition in this department, together with such as were distinguished as new and valuable improvements, have had the same under examination, and ask leave to report.

The most gratifying feature presented was the unprecedented display of machinery and implements of every description, adapted to every variety of labor. It seemed as if "*invention*" was let loose upon the world, as the pioneer in every industrial pursuit.

In this, as in every other effort of the human mind, there is something which may prove abortive, yet it indicates a strong persuasion that the world is full of secrets of high moment to man, and a conviction that the spirit of inquiry, by observation of facts, may arrive at important results in agricultural and mechanical pursuits.

The exhibition was well calculated to instruct all classes—demonstrating to them the progress made in every department of industry, showing them the necessity of keeping up with the age, of taking advantage of every facility offered in improved implements, and in improved modes of agriculture; of maintaining the prestige of position with all, in all the pursuits of life.

In pursuing the examination, we find it necessary to be extremely cautious to discriminate between the different things offered as "*improvements.*" The world is full of new inventions, possessing superior merits, if we believe their authors and vendors. We find some of those offered for competition exhibiting real worth, and calculated to facilitate labor; others worthless—"*made to sell.*" To the cautious, discriminating mind, the subject presents itself in all its practical phases. It

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selects and uses such as will aid in business. It is ever careful, not through extreme caution, to lag behind the times, or through undue zeal, to become the dupe of imposition.

The exhibition presented an opportunity for all to inspect these inventions; for the farmer to examine them, for their exhibitors to explain their use and value. It was a coming together of vendors and purchasers for mutual introduction and for mutual advantage.

1. One of the most useful and efficient machines presented for competition, and which is calculated to revolutionise the whole process of the "*cooper's trade*," is "TRAPP'S PATENT BARREL MACHINERY," exhibited by "*The Elmira Barrel Machine Manufacturing Company.*" This machine takes the timber in the bolt, saws the staves, hollowing with the grain; cuts them all of equal length, planes both sides smooth, joints them, giving each stave its proper proportion of bilge, bevels, cuts the crease, turns the head, and prepares the barrel for hooping, in a manner perfect and of the highest finish. With selected timber this machine cannot make an imperfect article, as the staves are all made of a uniform thickness, are jointed accurate, and true from one end to the other, ensuring casks that are tight, strong, of equal weight and capacity.

The machine is so arranged that it can be gauged to manufacture barrels or kegs of any size. It takes the stock in the rough, and turns out the work ready for hooping, at the rate of from seventy to one hundred barrels per day, according to their finish, reducing the cost of manufacture very materially. In view of its utility we award *a diploma and notice.*

2. *Pratt's ditch digger*, the committee consider the most valuable machine, or implement for the farm, either newly invented, or an improvement of any one in use, offered for competition, and award it *the Society's diploma and a Silver medal.*

The annexed cut represents PRATT'S DITCH DIGGER. It is all made of iron and steel, except the side wheels and handles, which are wood.

The wheel of shovels *a a* is an important part of the machine; in connection with the casing *b b* it takes up the earth, raises and discharges it on the inclined wings *c c* to both sides of the ditch. This earth is first broken up by the small plow *j*, which cuts deeper and wider than the casing. The plow *j* is made strong enough to break up hard ground found in subsoils, and which requires the use of the pick in the old method of ditch-

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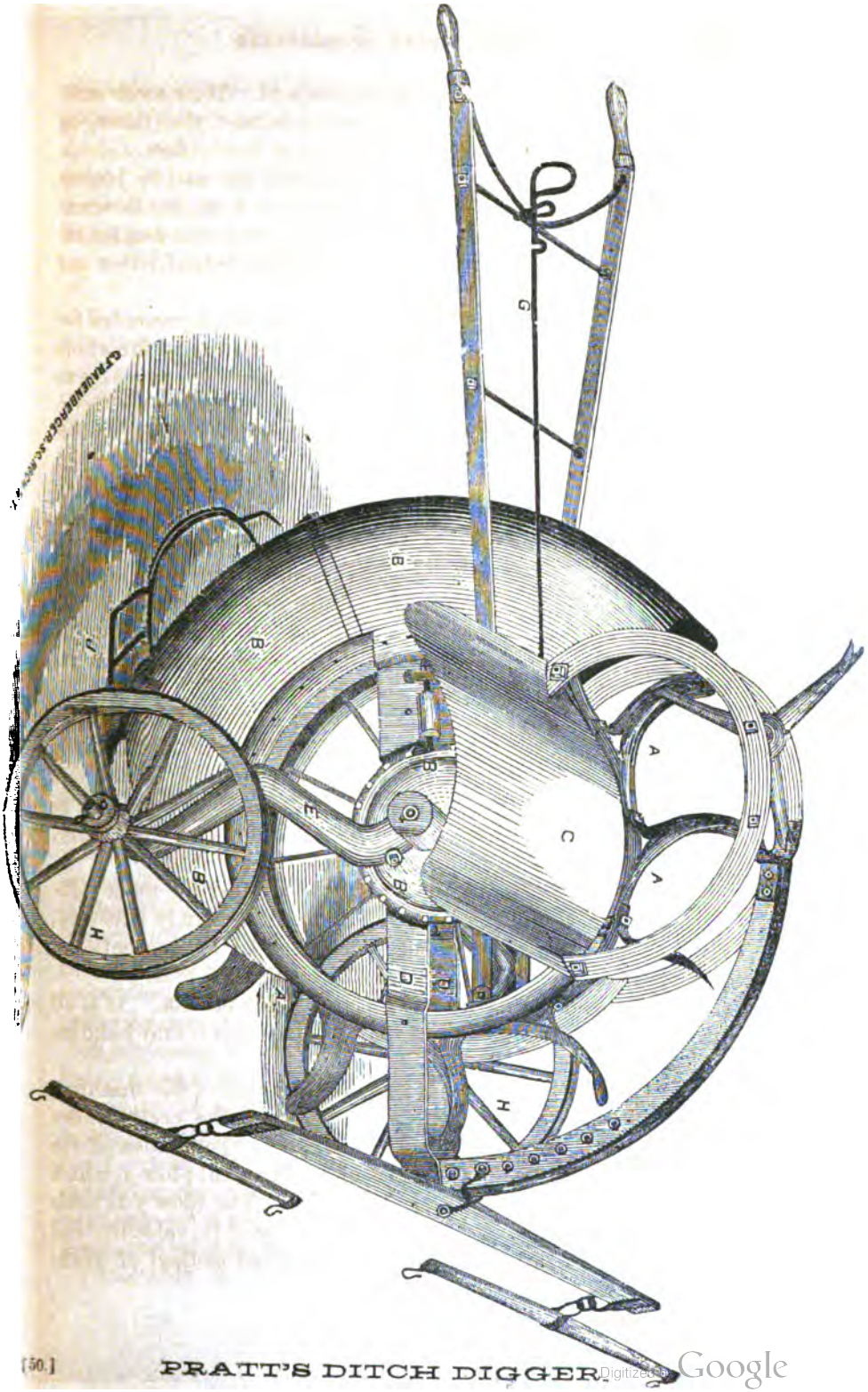

[50.] PRATT'S DITCH DIGGER.

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ing; the plow is also arranged to cut wide or narrow, so as to excavate ditches of various widths with the same machine.

The side wheels and cranks *h* and *e* are securely fastened by the shaft of the *center shovel wheel*, which passes through the beams *d d*, making them as if fast by one shaft; being thus fastened they balance the machine. The *side wheels* make the machine portable, by means of a ratchet wheel and spring catch, which is allowed to operate or not at pleasure, by the rod on the handles *g*. When the rod is drawn back into the catch, then the side wheels are free, and the shovel wheel lowers down and takes the weight, in which position it is ready to operate.

In making a ditch a furrow is first turned with a common plow, the ditcher then passes and repasses, throwing out the earth broken up by the plows *j* at the previous passage. The depth of each cutting must depend upon the strength of the team and the hardness of the ground. When very hard and stony the plow is held down in part by the handles, making the work about the same as plowing under similar circumstances. In any smooth bottom land the labor is less while in the ditch, and hardly more out.

The machine should be run out on a board or plank at the end of the ditch, upon which to stop and turn round; at turning let go the rod from the catch, and the side wheels are secured under the machine, taking its weight, turning round as easily as a cart by the joint action of the team and the handles; when turned round on the ditch draw back on the snap rod, and all is ready to go ahead. When the last cutting is to be completed, shove up the plow, or remove it, so that all the loose dirt may be thrown out, leaving the ditch, the grade being attended to, ready for the tile or stone.

The digger is worked by one man and two horses or oxen. In case of the latter a long yoke is used, and the former a long whiffletree, allowing them to spread each side the cutting and loose dirt.

When large stones are found in the subsoil the digger will lay them bare; an extra force applied to take them out; smaller stones are torn up and removed as if earth—the machine operating with the same facility in stony land as a common plow.

The committee witnessed the working of the digger, and were satisfied that by means of it ditching can be performed

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with great ease and dispatch. To the farmer it must prove invaluable.

3. "Pratt's tile and brick machine," the committee deem to be the best improved tile machine entered for competition, and award it the Society's *Silver medal.*

The figure annexed (3.) represents the tile machine.

This simple tile machine must reduce the amount of labor in making tile very materially; making the cost from *one-third* to *one-half* less than the present selling prices; thus inducing many farmers to enter upon a thorough drainage of lands, from which they have been, heretofore, deterred by the expense.

By means of this machine, a superior quality of tile can be furnished, at reduced rates, in every rural district; thereby rendering additional aids to agriculture, and material from which may be premised the most substantial and valuable improvements.

4. "Gibbs' patent plow grinder and polisher," exhibited by J. Gibbs, of Canton, Ohio, is a valuable invention, affording ease and despatch in grinding and polishing plow castings—inducing the plow maker to depart from the old plan of selling rough work, and freeing the ploughman from days drudgery before his plow is in a condition to do good service. It is a machine that every plow manufacturer should have, who seeks to merit public patronage. *Awarded a diploma.*

5. "Bramble's automaton grain scales," exhibited by S. G. Milligan & Co., of Buffalo, is awarded a *Diploma.* The automaton scales is adapted to flouring mills and forwarding houses. It receives the grain, weighs, registers and discharges it, and at the same time re-adjusts itself—all the power required is the gravity of the grain. The machine is a movable drum on a common platform scale—there seems to be nothing complicated about it. The smallest machine will weigh one bushel at a draught, and five draughts per minute—the largest fifty bushels per minute. We deem it a useful invention.

6. The machine for boring pump tubes—for fitting the ends, and a patent valve for retaining the water at any height in the tubes, exhibited by G. M. Wyeatt, of Elmira, deemed worthy of notice, and a *Diploma.*

7. As a manual labor-saving machine, the "gang creasing machine," exhibited by R. Willson, of Milton, Penn., presents unequalled capacity. It is capable of creasing seventeen different patterns and widths, of two different kinds, single and

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double beaded; the work is done in far less time, and greater perfection than it can be done by hand. This machine offers great facilities to the saddler and harness maker, in all the details of his trade, as also does the patent shaving machine, exhibited by the same person. *Awarded a diploma.*

8. "Coe's patent self feeding drill," is a machine very simple in its construction, easily managed and moved from one place to another. It is readily adjusted. It feeds itself with perfect uniformity, and bores with great facility. It presents all the capacities of a labor-saving machine, and is deemed of great value to the mechanic. Exhibited by L. E. Hewitt, Fulton, Oswego county, to whom is awarded a *Diploma.*

9. "Freeman, Cartwright & Co.'s shingle machine and jointer" of Ithaca, is deemed worthy of a *Diploma.* This machine is extremely simple in its construction, and efficient in performing—making shingles from any kind of timber. It works true and produces shingles of even thickness and taper.

10. "Perry's improved shingle machine," exhibited by Lyman Moore, of Howard, Steuben county, appears to combine all the essential qualities necessary to a durable and easy working machine. *Awarded a diploma.*

11. The "smut machine," exhibited by B. T. Tremaine of Monroe county, is deemed the best entered for competition, and awarded a *Diploma.*

12. The "patent portable morticing machine," exhibited by H. & S. H. Plumb, works true and perfect, and must be very valuable where fine work is to be performed. *Awarded a diploma.*

13. "M. B. Yogal's patent saw mill dogs," efficient in producing even work, and for avoiding injury to lumber in being sawed, so common throughout the country. Every saw mill should be supplied with them. *Awarded a diploma.*

14. The "model hay press," exhibited by George Snyder, is conveniently moved from place to place, works with great ease and facility, and has the capacity for exerting great power. It will no doubt prove a great acquisition to the farmer. *Awarded a diploma.*

15. No simple invention has, probably, produced more efficient results than that found in "Dietz' patent angular hame." It is so constructed as to fit the anatomical outline of the shoulder of the horse, and confine the draught entirely upon

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that point of the shoulder where the horse can exert the greatest strength in draughting. *Awarded a diploma.*

16. "Patent farm or road gate," exhibited by C. Winegar, of Cayuga county, is very convenient for passing through without stopping to open or shut, as this is done simply by touching a lever (in approaching the gate), to open it, and another (after having passed through the gate), to shut it. It is so constructed as to keep in working order through all seasons of the year. *Awarded a diploma.*

17. "Lum's patent self acting gate," is so arranged that in driving through in a carriage, the carriage wheel passes over an iron lever, as it approaches the gate, and opens it, and in leaving the gate, over another lever and shuts it. It is evidently a *summer* and not a *winter* gate.

18. The "draining tile and pipe," exhibited by John B. Dixon, of Geneva, is deemed the best entered for competition, and is awarded the premium of *five dollars.*

The attention of farmers being directed more recently to the subject of ditching and draining lands, the committee subjoin the prices for pipe and tile, as furnished by Mr. Dixon. It is sold per 1000 pieces, as follows:

Pipe.				Tile.			
1½ inch per 1000,.....			$9 00	2 inch, horse shoe tile, per 1000,.....			$9 00
2	do	do	10 00	3	do	do	11 50
2½	do	do	12 50	4	do	do	13 50
3	do	do	15 00	5	do	do	17 50
4	do	do	40 00	6	do	do	25 00
8	do	do	80 00	13½ pieces will lay one rod.			

19. Samples of stone pipe for drains, gas, and sewerage, exhibited by E. & D. Fosdick, & co., of Middlebury, Ohio. This pipe is glass glazed on the inside, and will not, therefore, alter the chemical properties of the water, or gas passing through it. It is capable of standing great presure, and well calculated for use in draining, reservoirs, and for hydraulic purposes generally, *awarded a diploma.*

For information of farmers &c., we subjoin the prices per foot for which the pipe is furnished, viz: 1 inch, 7 cents; 1¼ inch, 7¼ cents; 1½ inch, 9¼ cents; 2 inch, 12½ cents; 2¼ inch, 16 cents; 3 inch, 20 cents; 4 inch, 28 cents.

20. The model brick machine exhibited by I. Johnson, of Washington city, is deemed a very useful invention; it will

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materially aid in the moulding of bricks, and greatly improve their density and finish.

BELLS, ETC.

21. A. Meneely's Sons, of West Troy, exhibited three church bells of 501, 980, and 1947 lbs., one factory bell and one school-house bell, all fine toned, as may well be expected from their reputation in this department of manufacture. They also exhibited a *rotary yoke* for bells, by means of which the bell is more securely fastened, and can be turned to receive the wear of the clapper upon all parts of its inner rim equally. This is deemed a very great improvement, and for which is *awarded a diploma.*

22. Jones & Hitchcock, of Troy, exhibited three bells weighing 350, 952, and 2035 lbs. They were of high finish and fine tone, competing in every particular with any entered at the fair.

23. Fairbanks & Co. exhibited their well-known counter and platform scales, which for strength, durability and accuracy, have stood unrivaled throughout our country for the last twenty-five years. These scales have acquired the reputation of being *the standard* of accuracy and perfection, reflecting great credit upon *our home manufacture*, as also upon the establishment from which they are produced. No award within the province of this committee can in any way enhance their reputation.

24. The railroad track and platform scales exhibited by A. Blake, of Vergennes, Vermont, are of simple construction, very durable, and calculated to weigh tons, and single pounds with extreme accuracy. *Awarded a diploma.*

25. The one-horse stump machine, exhibited by R. H. Hall, of Owego, is a good invention, and will prove valuable for the purposes intended. It is easily moved from place to place, quickly adjusted, and the power directly and efficiently applied when in operation. *Awarded a diploma.*

26. The model stump machine, exhibited by Francis Moris, is deserving of favorable notice, as very simple and easily worked.

27. In this age of high speed and low prices over our line of railroads, any invention that may stay our velocity *through the world*, in case of accident, must be of great value to every *living* being. The self-acting brake for railroad cars is so adjusted that

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any accident throwing the cars together will immediately apply the brake and stop the cars. The brake is of sufficient strength to retain the cars at rest on any grade, ensuring great protection to both property and life. We deem the invention an important one, and award it *a diploma.*

28. Roe's patent cheese fixture, entered by Daniel Roe, of Rochester, is a labor-saving, compact, and convenient apparatus. It is formed of wood outside, lined with tin inside, within that a tin vat in which the milk is strained, surrounded by water, which is heated by means of a cylinder stove beneath. It is deemed a valuable addition to the cheese dairy. *Awarded a diploma.*

29. A favorable notice is here inserted of Woodworth's planing machine. To the lumberman, the mechanic, the contractor, it affords increased facilities. Much of the ease and dispatch with which buildings are now erected is, in a measure, owing to the opportunities offered for obtaining lumber planed, matched, and ready for being put together.

30. Also a favorable notice of the buckwheat huller and rye cleanser, entered as No. 53, by means of which the buckwheat is stripped of its hull, and most thoroughly cleansed of all foul attachments. Every grain mill ought to have one in operation, to ensure good work and superfine flour.

31. The stave dressing machine, entered by L. D. Benson, is deemed worthy of notice, and *a diploma.*

32. Ruggles' patent blast blower, entered by G. D. Harris & Co., is deserving favorable notice.

33. Improved circular saw, and tool to put it in order, exhibited by N. Barlow, of Newark, N. J. The improvement is in the shape of the teeth, being hooked, and so adjusted as to saw clean and fast. It is valuable in facilitating labor, both in the ease and dispatch of its performance. *Awarded a diploma.*

34. The garden and force pump, entered by Cowing & Co., of Seneca Falls, is a very handy article. It can be wheeled from place to place, and used for sprinkling gardens, trees, shrubbery, or, in case of fire, as a fire engine, to throw water on buildings. *Awarded diploma.*

35. Wilson's extension reach, for wagons and carriages, exhibited by Edwin Wilson, of Prattsburgh, N. Y., is a desideratum in the use of wagons and carriages, by means of which the gearing may be lengthened or taken up at pleasure. To the farmer who has heretofore traveled *to the woods* to manufacture

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a *home-made reach* every time he commences harvest or lumbering, this is a valuable invention. As a time-saving and convenient improvement, it should be attached to every wagon. We award it *a diploma.*

36. The liquid manure distributer, exhibited by Finly Fraser, of Trenton, N. J., is, no doubt, of increasing value to the agriculturist. We deem it important that by every appliance possible the farmer's attention be directed to facilities for manuring his lands and his crops. Here is one, by means of which he may fertilise the corn in the hill, the grain or grass sown broadcast, with great ease and dispatch. *Diploma.*

37. The clover-seed harvesting machine, entered by John C. Birdsall, of Monroe county, is a good machine, works well. *Awarded the premium offered,* $5.

HORSE POWERS AND THRASHERS.

In the construction of powers and machines a close observance of fixed laws in arriving at certain results is absolutely necessary. The utility of any machine is determined by those laws which lie at the foundation of *mechanics*, that the force necessary to lift any given body must be in proportion to the weight of the body, and also to the height it is to be raised. This is evident in raising simple bodies, but not quite so apparent in complicated machinery where force is applied to perform labor by increase of motion, or velocity, and yet the rule holds true here. In compound machines the same general laws govern. The power and weight are in the inverse proportion of their velocities. In every machine there are four things to be considered, first, the moving power, second, the velocity of this power, third, the resistance or weight to be moved, fourth, the velocity of this weight, or the space it moves over in the same given time that the moving power moves over. The first two are always in reciprocal proportion to the last two, and the product of the first two must always be equal to that of the last two. Hence, where *great power* is required, the increase of power must correspond to the decrease of motion, and where *great velocity* is required the increase of power is necessarily in proportion to the increase of velocity.

Upon the above principles depend the capacity of any power to drive machinery where *great velocity* is required; in the cylinder of a thrashing machine the power must be in proportion to that velocity, and the friction of the parts composing

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the power and machine, added to the resistance of the grain being thrashed. Of the several powers and machines entered for competition, the committee award

38. To Dow & Fowler, of Fowlerville, Livingston county, on their power and thrasher, *a diploma.*

39. To C. & L. Perigo, of Tompkins county, on their power, *a diploma*, and also notice favorably the powers exhibited by N. U. Tracy, of Penn Yan, B. H. Wakely, of Tompkins county, and the thrashers exhibited by David Anthony, of Schoharie, and by Emery & Brothers, of Albany.

GRAIN DRILLS, ETC.

In no department of agricultural industry are greater facilities offered than in sowing the cereal crops, and fertilizers, and from year to year *improved drills* are added to our stock of implements. Within the last two years, attachments have been added for sowing grass seeds and the different fertilizers, in the same process of sowing the grain.

40. The committee award to Bickford and Huffman of Macedon, on their first premium iron-cylinder grain drill, *a diploma.*

41. Also a diploma to P. Seymour, of East Bloomfield, on his "patent grain drill" and "patent broad-cast sowing machine."

42. Also a diploma to Foster & Jessup, of Palmyra, for the grain drill, with attachments of separate guano, plaster, and grass seed sowers.

43. And also notice favorably the "J. P. Ross patent grain drill," exhibited by J. M. Harvey & Sons, of Amsterdam, Montgomery county.

REAPERS AND MOWERS.

In reapers and mowers has been demonstrated the great American triumph over every other nation; in two separate trials at the world's fair, first in England McCormic proved the superiority of his reaper in the fields of that *old* country; and, then in France McCormic again with Manny, extorted words of surprise and commendation over every other exhibitor.

The exhibition of reapers and mowers was unusually large, comprising some ten different patents, some of them improved in the finger bars to avoid clogging, others in the knife, and many in the raking and delivery of the grain in bundles.

44. The committee received favorably the "new reaper and mower," exhibited by Dietz, Dunham & Trump, of Raritan,

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New Jersey. By its peculiar construction, motion is transfered to the sickle, directly from the driving wheel, by a simple lever, without any gearing of cogs or shafts. It is therefore greatly simplified in its action, and less liable to get out of order. To this is awarded a *Diploma.*

45. To Manny's combined machine is awarded a *Diploma.* To Sylla & Adams, of Elgin, Illinois, a *Diploma,* on their "grain and grass harvester." This machine is peculiar, in that the binders ride—the bundles are carried and deposited in quantities of any desired number. It is easily changd from a reaper to a mower, and the sickle bar when mowing lies flat on the ground. It has a flexible joint and is capable of adjustment to the ground's surface.

46. To. R. L. Allen, of New-York, a *Diploma,* on "Allen's patent mower." This is a newly invented machine, its gearing being hung on horizontal shafts and balanced, enables the mower to run true, and the form of the knife with a raised point and combination with the cutter bar, prevents clogging in fine and wet grass.

47. To Palmer & Williams, of Brockport, New-York, a *Silver medal,* on their "self-raking reaper." This machine will cut a swath six feet wide, and leave the grain in neat gavels ready for binding. The raking is performed upon a half circular platform, upon which the grain falls, the rake rising up and passing over the grain until it is in a line with the finger board, then falling suddenly, it gives a quick sweep across the platform throwing the grain in gavels behind the machine and out of the way of the team in cutting the next swath.

48. To H. D. Bennett, of Geneva, *a diploma,* on "Atkins' automaton reaper," exhibited by him.

49. The committee have favorably noticed "Ketchum's patent mower, with Hall's patent reaper and improvements;" "T. R. Hussey's combined mower and reaper;" "Manny's patent mower, with Wood's improvement," and "Wheeler's grain and grass harvester," as machines possessing merits, and of great utility.

CORN PLANTERS.

Corn planting machines of various descriptions were exhibited, showing the results of active ingenuity—all of them possessing merits, and some of them real utility.

50. We notice favorably "Wards' patent corn planter," exhibited by Myron Ward, of Owego. This planter is so arranged

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that it furrows, plants and covers two rows at a time, placing the hills even both ways, and drawn by a single horse will plant from ten to fifteen acres per day.

51. Randall & Jones' new premium corn planter is a machine constructed on entirely novel principles; it weighs about ten pounds, and plants double rows of corn by a single operation of lifting and pressing down as a staff.

52. Bordens' & McLean's patent seed planter, exhibited by Bordens & McLean, of West Dresden, Yates county, is a very simple machine, of low price, and every way calculated to work accurately in the hands of an observing laborer. The price is twelve shillings.

53. The hand corn planter, exhibited by Oren Stodard, is intended for planting a single row, and works well.

54. Wyncoop's patent corn planter, exhibited by H. L. Edson, of Corning, possesses merit, and is worthy of favorable notice; also the planter exhibited by B. A. Hoyt, of Barton, New-York.

55. A fine assortment of axes and helves, exhibited by Beardsley & Tyler, of Elmira, from their own manufactory, deserves special notice. They were all of fine finish, and of superior quality in material and temper. The edge tool manufacture is being successfully transfered to this side of the Atlantic, and many of the shops turn out work equal to any produced in Sheffield or Birmingham. SUCCESS TO AMERICAN MANUFACTURES!

FARM IMPLEMENTS.

56. For the best collection of plows in use in this country, with prices attached to each, the premium of a *Silver medal* and *diploma*, is awarded to C. M. Widrig & Co., of Elmira, who exhibited the following, viz:

	With clevis.	Wheel or cutter.	Wheel and cutter.
1 Eagle plow, No. 20,.....	$10.00	$11.50	$13.00
1 Eagle do C,.....	9.00	10.00	12.00
1 Eagle 41, left handed, ...	8.00	9.50	11.00
1 Eagle 47, do	9.00	10.50	12.00
1 Eagle 74, self sharpening,..	10.00	11.50	13.00
1 No. 1½ double mould board,	....	....	5.00
1 Eagle 33,deep tiller,full trim	....	....	12.00
1 Eagle 35, ...	....	....	9.00
1 Eagle 72, deep tiller,.....	....	....	12.50

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	With clevis.	Wheel or cutter.	Wheel and cutter.
1 Eagle 73, ...	....	....	13.00
1 Eagle 73½, ...	....	....	13.00
1 Rich side hill, ...	....	....	8.00
1 Reversable subsoil, ...	....	....	7.50
1 Eagle 33, double subsoil, ...	12.50	...	15.00

"Best plow with newly invented principles not heretofore known, beneficial to the farmer," &c. Under this head were entered several plows claiming to have arrangements not heretofore used, and to prove beneficial to the farmer. Among these were "C. R. Brinkerhoff's self-holding furrow gauge plow;" "Pointer iron beam plow," (W. P. Ottley); "Weird's patent sward plow," (Liv. co.); "Wilson's improved iron beam plow;" and also the plows entered by S. S. Granger, N. U. Tracy and I. D. Payne; but none of them presented any improvements not heretofore known, or used, in this or other countries. Some of these plows were improved in certain particulars, as Wilson's plow, in the shape of the mold board, by which clogging of the soil is prevented, and the turning over of the furrow slice is ensured. The "self-holding plow," exhibited by C. R. Brinkerhoff, had attachments of wheels, &c., which have been long used in England, but which, with us Americans, present too many complications, and too great weight to be deemed either of useful or practical merit.

Every agricultural implement should be adapted in form and construction to the purposes for which it is intended. THE PLOW ranks foremost in use and importance with the farmer, and it differs materially, with his labors, whether it be illy or appropriately formed and adjusted.

The ground should be plowed to a sufficient depth, varying with the nature of the soil. The furrow should be well turned; it should be straight, and in the performance of its work the plow should be so constructed as to be of light draught—of steady, even motion, requiring the least possible labor to the plowman and team.

We have no doubt but that some improvements in the construction of the plow are as yet unattained, which are important to the desirable performance of this portion of agricultural labor. A defect, in some plows, is palpable in too abrupt wedge, formed by the share and mold board, by means of which much power is lost, and the motion rendered unequal. In all cases, the plow should be so arranged as to stand and work

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level—the rise from its point to the heel of the mold board should be gradual, so as to cut, and lift the furrow slice by an easy progress, and its course through the soil should be steady, level, and of easy guidance and draught. For this end the plow should be constructed with proportionate length from the point to the heel of the mold board with the width of the wing of the share, so as to avoid too great friction, and handles (horizontal measure), of sufficient length to ensure easy holding and guidance. The easy and steady motion of the plow is also secured by observing the "line of draught;" this depends upon the adjustment of the beam, the clevis, and chain or traces, so that the plow is caused to run even and steady, and to press equally all along its base.

The wedge of the plow ought to be more blunt, or gradual, as it is intended for pulverising the soil, or for turning over heavy sod, and the discriminating mechanic will adjust the implement for the particular use for which it is designed, while those who never discriminate will continue to vend such as we have in too common use, and with which we labor hard with very unsatisfactory results.

57. The committee has noticed Hildreth's iron gang plow as an implement of compact form, and well calculated for top cultivating, and fitting the soil for seed, and award it *a diploma.*

58. Also to Robert Wilson, of Burdett, Schuyler county, *a diploma* for his improved iron beam plow, which, in several particulars, is adapted for deep and thorough tillage.

59. We also notice favorably the plows entered by S. S. Granger, Horseheads; C. R. Brinkerhoff, Batavia, and William P. Otley, Phelps.

60. Sheep shearing machine, entered by E. B. Williams, of Michigan, was noticed by the committee, and was deemed of appropriate construction to answer the purposes for which it was intended, but its operation, when under examination, did not work well, either as to speed or superior execution, which may have been the fault of the exhibitor and not of the machine.

In consequence of the unprecedented number and variety of articles entered for competition, and referred to the committee, the examination of any one was necessarily limited, and the results to which we have arrived were such as the time and circumstances warranted. All which is respectfully submitted.

Committee.—G. Denniston, George Geddes, John McCarty, Moses Beecher.

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ANNUAL MEETING

OF THE

NEW-YORK STATE AGRICULTURAL SOCIETY.

WEDNESDAY, *February* 13.

The annual meeting of the State Agricultural Society was held in the Assembly Chamber at 12 o'clock. There was a large attendance of the members of the Society, though quite a large number from distant counties were unable to reach the city, in consequence of obstructions on the railroads from the storms. Several gentlemen from abroad were present: George Hartshorne, Esq., Vice President, and J. O. Frazee, Esq., Secretary of New Jersey State Agricultural Society; and J. Q. A. Warren, from California, resident editor California Farmer at Boston, and Sanford Howard, Esq., editor of the Boston Cultivator.

The President, Mr. CHEEVER, called the Society to order.

The Secretary read the annual report.

The Treasurer's report was read by the Secretary, and presents the following results:

TREASURER'S ACCOUNT.

By payment Dr. Fitch, Entomologist Society,.....	$1,300	00
expenses winter meeting, 1855,.....	140	25
printing and advertising,.....	388	42
museum expenses,.....	43	26
postage account,.....	195	52
library account,.....	145	43
incidental and miscellaneous expenses,.....	1,210	95
expenses on account of fair in New-York, ...	265	50
premiums paid on account of fair in do,.....	319	00
premiums paid on account of winter meeting,...	819	50
salary account—traveling expenses, &c., ...	2,514	17
premiums paid on account of fair at Elmira,....	4,488	87
expenses of fair at Elmira,.....	1,032	23

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By superintendents at Elmira,	$323 75
clerks, business and treasurer's offices,	450 00
police and gate tenders,	165 00
refreshments for judges, &c.,	500 00
	$14,301 86
Receipts from all sources,	$17,045 55
	14,301 86
Balance,	$2,743 69
Premium medals on hand,	50 00
Premium books on hand,	175 00
	$2,968 69

Senator Kelly, of Dutchess, moved the adoption of the reports.—Agreed to.

Mr. Clark, of Otsego, moved a resolution, that it was expedient to amend the constitution, so as to permanently fix the place of holding the State fairs of the Society hereafter, at one, two or three places, as the Executive committee shall determine.

The Secretary read the returns from the several County Societies, which had acted upon this subject. The following was the result:

Against permanent location—Clinton, Chautauque, Montgomery and Ulster—4.

For a permanent location—Lewis, Washington, Seneca, Oneida, Putnam, Wayne, Cayuga, St. Lawrence and Otsego—9.

Mr. Corey, of Saratoga, moved to lay the resolution on the table.

After some conversation the motion to lay on the table was withdrawn.

Mr. Frost, of Schuyler, moved to amend, that Albany, Syracuse and Elmira be the permanent places for holding the fairs hereafter.

Mr. Burroughs, of Orleans, opposed the proposition. In his opinion to locate the fair would be to destroy the Society. He said, if fixed localities were adopted, a distinct Society will be organized for western New-York. He warned the Society against adopting so suicidal a policy.

Mr. Clark opposed the amendment, because he desired the constitution amended without naming the localities. That can

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be done afterwards. The amendment was not in accordance with the original notice, which named no localities.

Mr. Frost sustained his amendment, as being entirely in order.

The specific amendment was opposed by Messrs. Miller, of Monroe, Conger, of Rockland, and Baldwin, of Onondaga, when

The Chair decided Mr. Frost's amendment out of order. The constitution requires a year's notice of any amendment proposed. The notice given last year named no localities, but read "one or more." The pending proposition is specific. Indeed, Mr. Clark's motion he deemed also out of order, because it limited the localities to three.

The several propositions were then withdrawn.

On the question coming up directly.

Hon. G. W. Patterson, of Chautauque, deemed the proposed amendment ridiculous. A permanent location "at one or more places" would be absurd. The State fairs are now permanently located at "one or more places." He believed it would be best for the Society to do as heretofore—change the places from year to year, so as to accommodate the whole State.

Mr. Clark sustained the motion to amend, and it was further discussed by Messrs. Richardson, Stevens, Crosby and Baldwin.

Before the question was taken, the Society adjourned to 3½ o'clock.

WEDNESDAY, *Feb.* 13—3½ P. M.

Upon the reassembling of the Society,

The President decided that the proposition to amend the constitution, proposed by Mr. Clark, of Otsego, was not in order, on the ground that the original motion of last year was defective, and could not be made the basis of any action now.

Mr. Clark appealed from the decision, and demanded the ayes and noes on his appeal.

The result was announced—ayes 138, noes 23. So the decision of the Chair was affirmed.

Mr. Corey moved the appointment of the usual committee of 24—three from each judicial district, to be selected by the respective delegations—to report the names of officers of the Society for the ensuing year, and to recommend a place for holding the next annual fair.—Agreed to.

The committee thus constituted was as follows:

First District—Messrs. W. B. Leonard, A. O. Moore, E. G. Faile.

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Second—Messrs. Wm. Kelly, Saxton Smith, H. B. Crapsey.

Third—Messrs. Herman Wendell, J. S. Gould, J. I. Johnson

Fourth—Messrs. Hugh White, John McDonald, Tunis J. Vanderveer.

Fifth—Messrs. Henry Wager, John A. Sherman, Enoch Marks.

Sixth—Messrs. Geo. Clark, G. J. J. Barber, Abram H. Miller.

Seventh—Messrs. E. S. Hayward, Wm. Johnson, D. W. C. Van Slyck.

Eighth—Messrs. Geo. W. Patterson, Silas M. Burroughs, Hollis White.

The committee retired for consultation.

While the committee was out,

Mr. Denniston, of Steuben, the first President of the Wool Growers' Association of Western New-York, said the Association was organized about a year since. Its object was not to limit it to the State, but to make it a national institution. The first meeting was but thinly attended, and it was doubtful whether a feeling sufficiently general could be excited to justify a permanent organization. But earnest men engaged in it, elected their officers, and the ensuing spring there was a better attendance. The first exhibition was held in May, at Bath, and premiums offered to the amount of $500. Sheep, of the first grades, were on exhibition from Vermont, Pennsylvania and Ohio, as well as from this State. The premiums were awarded, and from the numbers present, and the spirit exhibited, a future was promising to the association.

The last meeting of the Society was held in January, at Penn Yan, and, after arranging the premium list—classifying the list into five classes—which reached over $1,000, the exhibition was fixed for the 27th, 28th and 29th of May next, at Penn Yan. Vermont and Ohio have promised to be on hand, and wool growers generally will be there, as competition will be open to every State in the Union. He believed the result of this movement would be beneficial.

Judge Miller, of Monroe, briefly addressed the Society in regard to *fruit*. Last year there were no peaches in western New-York, and fears are entertained that the same misfortune will be experienced this year. The winter has been very severe—quite as severe as the last. But the result is not yet ascertained. It was contended by some that the embryo bud was not destroyed by the cold, but this was a novel suggestion to him. He had always supposed otherwise.

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Mr. Baldwin remarked that a gentleman in Pennsylvania had raised as fine figs in that State as were ever produced in a southern latitude. His process was, in the fall, to loosen the roots of one side of the tree, bend it over to the earth, and cover it up through the winter. In the spring he forced it back, when it produced abundantly. Might not the peach be saved in a similar manner?

Mr. Newcomb had noticed that the peach tree had borne abundantly on hills when they had been barren in the valleys. Why this was, he did not know, for it was generally colder on the hills; or was it because fogs settled in the valleys. Gentlemen present say that at least half or more of the buds on their trees were now destroyed. This was no great loss, because peach trees were usually too heavy laden. Peach orchards, as a general thing, produced best on hilltops.

In four years, an orchard, if carefully nursed, will be as far forward as one ten years old, if left as they ordinarily are. A fruit tree should be nursed as carefully as a living thing. There is no danger of over-stocking the market with good fruit. And good fruit may be secured always, by purchasing from reliable nurserymen; and there are such—as exceptions, perhaps, to a general rule. Amateurs need not always be humbugged.

Mr. Stevens, of Genesee, said the temperature of the valley was not always milder than that of the hill. The reverse was generally the case; and hence it is that peaches oftener survive on hills than in valleys. A gentleman present says he has noticed a difference of ten degrees in as many rods between the valley and the hill.

Mr. Miller, of Orange, had always been ardently attached to the culture of fruit. It was a pleasant and happifying pursuit. There is scarcely such a thing as good winter pears, and there are very few good apples to be found after the 1st of February. This should not be so, because it need not be so. He spoke at considerable length.

Judge Cheever said any one could, by a little care, decide whether the peach bud was destroyed. Take off a limb where the blossom buds. Take a sharp knife and open the bud. If the frost has touched it, the heart or germ of the bud will be brownish. If living, the germ will be green. On examining his peach trees, he found that about two-thirds of the buds were destroyed. The thermometer at 10 or 14 degrees below zero,

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will be pretty sure to kill peach buds, unless they are well protected. It is undoubtedly true, that there is greater cold in valleys than on hills. And fruit is oftener destroyed on low than on high lands, because low lands are generally most fertile, and there the wood is most full of sap, and hence frost acts most rapidly upon it. He believed that trees could be brought to a bearing point much sooner than was generally believed. He had himself gathered pears from standard trees in four months after he set them out.

Mr. J. W. Osborn, of Albany, moved to take up the notice of last year to amend the constitution, so that it may be amended at any annual meeting, by a majority vote, without a year's previous notice.

Mr. Corey, of Saratoga, objected to the amendment. If adopted, the constitution could be entirely frittered away, at any annual meeting, by a crowd got up in the locality of Albany.

Judge Miller took a similar view of the subject, and would prefer to extend rather than abridge the time required for notice to be given.

Mr. Stevens, of Genesee, moved to lay the motion on the table. [Agreed to.

Mr. Conger, of Rockland, responded to a call of the Society, and spoke upon the general subject of plants, and, in the course of his remarks, referred to the peach tree. Where the tree does not produce, he suggested that it was because it had not been sufficiently nurtured. He thought the tree should be more closely trimmed than was usual, so as to retain more of the vital forces, and more of the glutinous substances which cover the blow.

He alluded to the Cashmere goats exhibited at New-York, and recently introduced from the Himalaya mountains. Their hair was about as fine as the hair out of which the Cashmere shawls were formerly made. These goats had been purchased by a gentleman in Georgia, and had been successfully crossed. The product of the cross is not a mule, but propagates. The yield of hair is large, and it is believed it can be used, advantageously not only for fine but for coarse cloth. He gave an interesting physiological account of this animal, and expressed the opinion that its introduction would be found practicable and profitable. In Paisley, Scotland, the fleece of the Cashmere goat sells for

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$6 per pound, and each animal produces from 8 to 10 lbs. The cross on the Rocky Mountain goat would, he believed, be successful. A cross on a goat of the South had been sold for a large sum. They could live where sheep could not, and if the finest sheep were crossed, he believed the wool would be greatly improved.

Mr. Dickinson, of Steuben, spoke at considerable length and with much spirit, upon the subject of fruit growing. He gave his experience, and the success which had attended his labors. He generally, by packing snow around the roots of his trees, and covering that snow with manure, kept back his blossoms a fortnight, and so saved them from frost; and he kept off the curculio and black knot from his trees by placing leached ashes at their roots, and profusely washing the branches with soft soap. He never saw a curculio in his orchard.

Mr. Patterson, of Chautauque, from the committee of 24, reported Utica as the locality for the next State fair.

And also the following list of officers for the ensuing year:

President—Theodore S. Faxton, Utica, Oneida county.

Vice-Presidents—1. Jonathan Thorne, New-York; 2. Edward G. Faile, Westfarms, Westchester county; 3. Herman Wendell, Albany; 4. William Knox, Canajoharie, Montgomery county; 5. Enoch Marks, Camillus, Onondaga county; 6. Francis M. Rotch, Morris, Otsego county; 7. D. W. C. Van Slyck, Lyons, Wayne county; 8. Alonzo S. Upham, Le Roy, Genesee county.

Executive Committee—Hugh Crocker, Utica; C. S. Wainwright, Rhinebeck, Dutchess county; George J. J. Barber, Homer, Cortland county; Alaric Hubbell, Utica; James Brodie, Ellisburgh, Jefferson county.

Corresponding Secretary—Benjamin P. Johnson, Albany.

Recording Secretary—Erastus Corning, Jr., Albany.

Treasurer—Benjamin B. Kirtland, Albany.

Mr. Maxon, of Jefferson, moved to substitute Watertown for Utica, as the place for the next State fair.

Mr. Baldwin, had proposed to move Syracuse; but would give way to Watertown, and advocated Watertown or Syracuse.

Mr. Patterson had desired to go to Watertown, and had so voted at first. But he had become convinced that it would be altogether impracticable to secure the necessary conveyances to that point. There was but a single track from the Central line, and but one track to the St. Lawrence. This was not sufficient.

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Mr. Baker, of Onondaga, advocated Syracuse.

Mr. Dickinson advocated Watertown, as an act of justice to that section of the State.

Judge Miller sustained the proposition to go to Syracuse or Watertown, rather than Utica.

Mr. Richardson, of Albany, moved to strike out "Utica." [Agreed to.

Watertown was then inserted.

And the officers reported were unanimously elected.

Mr. Richardson of Albany, gave notice of an amendment of the constitution, as follows:

Strike out all after the word "fair" in section 5, and insert the words following:

"Alternately in three places each in a different judicial district, which shall be chosen by a majority vote at the annual meeting of the Society in February, 1857, and which shall thereafter be the permanent localities whereat shall be held said annual cattle show and fair, triennially in the order of their selection. Provided moreover that on behalf of the places so designated, security satisfactory to the Executive committee shall be given on or before the first day of May, 1857, for the providing and furnishing suitable grounds, buildings, fodder, and such other accommodations as the Executive committee may decide to be necessary, free of expense to the Society. In the event of such security not being given for the place first selected, the cattle show and fair for 1857, shall be held at the place next in the order of selection, which shall comply with these requirements. Should neither place furnish the required security, the committee shall designate another locality for 1857. Any vacancy in the number of places designated as herein required, which may exist at the annual meeting of the Society in February, 1858, shall be filled at that time in such manner and with such limitations as a majority of the Society shall decide upon.

Col. E. C. Frost gave notice of an amendment to Mr. Richardson's amendment, "That the annual fairs be permanently located by the officers of the Society, at Albany, Syracuse and Elmira; provided such locations furnish the necessary arrangements."

Mr. George Clarke, of Otsego, gave notice of his intention, at the next annual meeting of the Society, to move to amend the fifth section of the constitution, so that it shall read as follows:

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"Section 5th. The society shall, at its annual meeting in 1857, permanently designate one, two or three places, as a majority of said meeting may elect, for holding, in future, the annual fairs or exhibitions of said Society."

The Secretary was directed to publish, in the January number of the Journal, the notices of amendments to the constitution, and 200 extra copies.

Society took a recess until 8 o'clock.

At the close of the recess, Asa Fitch, M. D., Entomologist of the Society, delivered a very able and instructive lecture on the subject of the entomological survey of the State.

At the close of the lecture,

On motion of Mr. Lawrence, of Queens county, the thanks of the Society were tendered to Dr. Fitch for his very interesting and useful lecture, and a copy requested for publication.

Society took a recess until the 14th at 12 o'clock, at the agricultural rooms.

THURSDAY, *February* 14.

The President in the chair.

On motion of Hon. A. B. Dickinson, of Steuben county,

Resolved, That the Legislature be respectfully requested to appropriate the sum of $1,000, as heretofore, to enable the Society to continue the entomological survey of the State, under the direction of Dr. Fitch.

Premiums were announced by the Secretary.

THURSDAY EVENING.

The Society assembled at the Capitol in the evening—the President, Mr. Cheever, in the chair.

The President introduced to the Society, Professor Samuel W. Johnson, of Yale College, who delivered a very able and instructive lecture on "the relations which exist between Science and agriculture."

At the close of the lecture,

On motion of Mr. E. A. Lawrence of Queens county, the thanks of the Society were tendered to Prof. Johnson, for the very able and appropriate address, and that a copy be furnished the Society for publication in the Transactions of the Society.

The Secretary presented an invitation to the Society, to attend the next annual meeting of the American Association for the advancement of Science, to be held in Albany, the third week in August, 1856.

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Hon. Mr. Conger, of Rockland, offered the annexed resolutions, which were unanimously adopted, prefaced with some very appropriate remarks:

Resolved, That the Agricultural Society of the State of New-York, accept the invitation of the American Association, for the advancement of Science, to attend their annual meeting in August next.

Resolved, That this Society unite with the local committee of the American Association, for the advancement of science, in the invitation which has been presented to the illustrious Liebig, of Munich, to attend the next annual meeting of the said association.

Resolved, That copies of the foregoing resolutions be forwarded to Prof. Liebig, by the Corresponding Secretary of this Society, who is hereby requested to solicit his acceptance of the said invitation, in behalf of this Society, and the farmers of the State of New-York.

The President, Mr. Cheever, then delivered the annual address, and at its close introduced to the Society, Theodore S. Faxton, Esq., who, on taking the chair, addressed the Society with appropriate remarks.

On motion of Mr. Henry Keeler, of Westchester county,

Resolved, That the thanks of the Society be given to the late President, for the efficient manner in which he has discharged the duties of his office, and for the very instructive address delivered, and that a copy be requested for publication.

On motion of Mr. Johnson,

Resolved, That the Executive committee be requested to make application to the Legislature for an appropriation to complete the rooms appropriated to the use of the Society.

The thanks of the Society were also moved to the Hon. the Assembly, for the use of their rooms for the meetings of the Society. Adjourned.

B. P. JOHNSON, *Corresponding Secretary.*

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LECTURE,

BY SAMUEL W. JOHNSON,

PROFESSOR OF ANALYTICAL CHEMISTRY IN THE YALE SCIENTIFIC SCHOOL.

"ON THE RELATIONS THAT EXIST BETWEEN SCIENCE AND AGRICULTURE."

MR. PRESIDENT AND GENTLEMEN:

In responding to the call with which I have been honored, to address you on this anniversary occasion, I invite your attention for an hour to some considerations on the relations that exist between agriculture and science.

You meet this evening to review the labors and results of the past year, and not less to consider the means of future progress.

The past bears ample witness to the ability and zeal with which the New-York State Agricultural Society has discharged its imposing responsibilities, and the present finds you earnestly inquiring what remains for it to accomplish.

In speaking of science, I am not here to remind you of her achievements; all over our land they are familiar as household words. Not only has science long been the pride of our Universities, but she has put on the leather apron, and become a willing helper in our manufactories and workshops.

The day is past when the farmer threatens her with a suit for trespass if she put foot upon his ground; nay, profoundly conscious of her wisdom and insight, he invites her counsel, and every year millions of sheaves are reaped from fields that have been fertilized by her ministrations.

It has been the success that has followed the application of science to manufacturing arts, which has aroused the hope that she may contribute to the advancement of agriculture. It is especially the science of chemistry that has now become the signal means of improvement in a hundred branches of in-

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dustry, not less than the basis on which alone they can securely rest. The manufactures of glass, porcelain and earthenware, of nearly all illuminating materials, of soap, of all coloring matters and pigments, the immense business of dying and of calico printing, and the beautiful arts of electro plating, electro typing and photography, not to mention a multitude of inferior industries, although mostly of an empirical origin, have been so remoulded and improved during the last fifty years by the young science of chemistry, that were its influence blotted out, we should seem to fall back a century in our social development.

Why has not *agriculture* shared in this progress? I answer, it *has* shared therein, though to a less striking and less profitable degree. The arts to which allusion has been made mostly involve only inorganic or dead matter, and their study, thus withdrawn from the dominion of all but the chemical forces, is very easy compared with the investigation of the problems of agriculture, which are, of all others, the most complex and difficult; because, in the soil for example, not only all the forces of out-door nature are at work, but they operate upon the most various combinations of a dozen elements.

Heat, water, oxygen, carbonic acid, ammonia, nitric acid, sulphuric acid, phosphoric acid, chlorine, silica, alumina, iron, lime, magnesia, potash, soda, humus, which is itself a little chemical kingdom, clay, sand, marl, gravel, chalk, cohesion, absorption, retention; these are only a specimen of the names included in the word soil, each one of which has a significance and an importance.

But it is not the soil only, which concerns the farmer; there are the seed and the growing plant, to what a host of influences are they subjected! The soil merely gives the plant a firm resting place and a tithe of its food; every wind or breath that passes, nourishes or poisons, warms or chills, refreshes or blasts it. The sun-beam is life to it for weeks and months, and then may wither it in a day. It grows awhile in beauty and with promise, until some unseen worm gnaws at its root, or an insignificant fly lays its eggs in the flower, and it disappoints the toil and care of the husbandman.

The rule in scientific investigation is to separate from the subject under examination all extraneous conditions and circumstances, and reduce a complex question to its simplest elements. The bundle of sticks can only be broken by taking

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them singly. Now, the grand questions of agriculture are so complex and involved, that it is no wonder they are so little understood, especially where they touch upon the mysterious domain of life.

But there are other reasons than the inherent difficulty of the subject, which have prevented the more rapid development of agricultural science, reasons which lie in agriculture itself as it is in agricultural practice.

One of these is the lamentable circumstance that our agriculture is so barren of facts, I mean that kind of facts which only can form the foundation of science; I mean complete facts. Complete facts are the truth, the whole truth, and nothing but the truth. All others bear a false witness; false, because partial, and cannot be admitted to testify in the courts of philosophy; or if their deficiencies escape detection, and their depositions are received, a wrong verdict will be rendered.

The husbandman has been baffled by the number and intricacy of the causes and conditions that influence his results; his reason has been discouraged and stupefied by its inability to harmonize the various, often conflicting, and often hidden agencies of nature, and the habit has been confirmed through centuries, of adopting maxims and empirical rules as guides in the cultivation of the soil.

These maxims have been mostly the result of experience, and so far have been correct and satisfactory, but they have been derived usually from a limited experience, have been originally found true only in a narrow district, and the precise circumstances that have made them applicable have not been understood, so that when put into practice elsewhere they have failed utterly, or what is worse, partially, yet not to such a degree as to lead to their rejection. To illustrate this, I have only to refer to the variety of opinions and practices that are met with among farmers. Here,we find that statements are laid down without the slightest qualification, as containing the essence of fact, which there, are totally denied and reversed.

What is public opinion with regard to the merits of fertilizers? From one quarter we hear that it is poor economy to haul stable manure a mile when guano can be had at a reasonable rate; from another district farmers complain that guano has impoverished their lands, and they have been compelled to return to stable manure, or have begun the excavation of their muck beds.

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A great difficulty is met with in the habit of guess work, which is so thoroughly a characteristic of farmers as a class. The farmer is accustomed to do things at a venture, and there is much in the nature of his business that accounts for this. The accidents of rain, drouth and frost he *cannot* provide against, they are entirely beyond his control, so he is satisfied to believe that the fertility of his field is to a great degree a matter he can only distantly influence. If his soil be fertile he rarely realises that it may be worn out. If it be poor he rarely is able to do more than try successively the hundred methods that he may find recommended for its improvement; but be it as it may, whether he succeed or not, how very rarely does success follow the judicious special application of principles which point clearly and inevitably to their result.

What we thus observe as generally true with regard to the masses of agriculturists, I do not intend to impute to their blame, it is the natural consequence of the difficulty, nay, almost hopelessness of understanding any great part of the rationale of agriculture, without special education. The result, however, is that we have so few practical data, which are settled beyond controversy.

Finally, in accounting for the little effect science has had upon agriculture, we must not forget that it is an invariable law in all nature that ends are proportional to means.

It must be remembered that until within a very few years, Practice has not asked any favors of Science; much less appropriated essential aid to her investigations.

Scientific men, impelled by a love for investigation, arrived at general truths, which they saw to be of important applications in agriculture, and which they willingly gave to the farmer. These general principles belonging to the great system of natural science being once established, science has fulfilled her duty towards agriculture. It now becomes the duty of agriculture to take up the investigation on her own account, to develope the special laws of nature that affect her operations, and to establish herself on a scientific, i. e. on a rational and enduring basis.

The great general principles, so fruitful on account of their extended application, appeared to be extempore efforts of genius, for one day they were unknown, and the next they burst into full glory, but the student of the history of science knows that they had been for centuries slow-forming in the womb of time,

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knows how many earnest workers in the mines of truth had toiled on with poor requital, opening the shafts and sifting rubbish through many generations, till at last some new recruit to their ranks struck the last blow, and the gem was uncovered. Every great result has cost great labor, and so it will ever be. The means we use must be proportioned to the ends we will accomplish.

If practical men require that science become their adviser and helper, they must see that she is substantially encouraged and supported in her efforts.

The time has arrived when the expediency of devoting means to special agricultural investigations is widely admitted.

Notwithstanding these hindrances to the development of a scientific agriculture, much *has been* accomplished, and the subject has been steadily gaining place in the public estimation.

Conscious of the liberal and enlightened views entertained by this distinguished audience, the representatives of the people and of the farmers of the Empire State, I feel that to put forth in detail the reasons why science may be useful to agriculture, would be to prove what you are already fully convinced of; and to argue the expediency of immediate provisions for the special scientific investigation of agricultural questions, would be to urge what you are only waiting to find practicable, to put into vigorous execution. I therefore ask your attention to some general remarks upon the method of conducting agricultural inquiries, including notice of a few recent investigations, and a brief sketch of what may be done by judicious effort in this direction.

The method of investigation.—This must be the method of science, the method that led Galileo, Newton, Humboldt and Liebig, to their immortal discoveries. The science of a subject may be advanced by the discovery of new facts, and of new principles. From the comparison of facts we are led to principles. The Baconian process of philosophical induction, ascends from the effect to the cause, reasons from a few parts to the whole. The principles being established, the natural process of deduction or inference descends from the whole to all the parts. It is thus that beginning with the knowledge of a few facts acquired by experience, we are able by mental operations, to previse, to foretell a whole series of facts, that may never have been observed or suspected, but which are manifested so soon as the foreseen conditions are united.

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These considerations make it obvious that the first thing to be done is to multiply facts. This is accomplished by observation and experiment. Ordinary observation takes cognizance of what transpires in the usual course of nature. Experiment is that refined instrument of modern research which *interferes* with the ordinary course of nature, and compels her to unusual manifestations. Observation is the eye that watches her voluntary movements, and the ear that hears her willing revelations. Experiment is a wise cunning that cross-examines her, and pries out her secret counsels.

I have already alluded to the roughness of ordinary agricultural observation. This arises to a great degree from a want of knowledge as to where lies the gist of the observation, and amounts to an incapacity for observing.

What keenness of perception we attribute to the Indian, who traces his way through the forest with invariable accuracy, by little indications that to us would be undistinguishable. The secret is, that he knows *where to look*. So in agriculture the observer must have a knowledge that may guide him where to look. He must be trained to follow the trail of truth.

It is so too with experiment. There is no lack of agricultural experiments. Unfortunately, however, it is mostly difficult, nay, impossible to find any good reason why they have been made, they are so barren of useful results.

The empiric experiments at a venture, without any probability to guide him. His hap-hazard trials often reveal new facts, but he rarely contributes largely to scientific progress, *because* he makes hap-hazard experiments—because he does not reason.

The philosopher experiments with an object in view, and distinctly in view. He does not indulge in small talk with nature, but puts earnest questions to her.

The course he follows in the investigation of a subject little known is this: He first collects and collates all the facts known with regard to it. He then seeks to construct a consistent explanation of these various facts. It may be that he finds it impossible to do this. Then he must verify the facts; perhaps some are false, or he sees them from an insufficient point of view; or he must collect more of them by extending his observations, it may be by experiment. He shortly is enabled to form a hypothesis, to frame a theory which promises to account for the facts. Yet it is not hypothesis, but truth he seeks, and

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now he begins to test his theory. Every deduction which he can draw from it must prove true, else the theory is false. He therefore unites the conditions which his theory indicates will produce a given prevised result. If the result follow, his theory is confirmed, otherwise it must be rejected and a new one formed and similarly proved. Here, is where experiment assumes its chief dignity and value. Here, it must be suggested by reason, or it cannot be expected to answer any good purpose. Here, if rationally devised and skilfully executed, it must reveal a truth, and though the truth be negative, it is not the less valuable, for every new negative result limits within narrower bounds the space wherein positive truth is to be sought.

The process of investigation is best understood by an illustration, and I will presently offer one, but before that, something more may be appropriately remarked with regard to the means of acquiring facts, and the instruments of research.

How little is to be expected from mere farm experiments conducted without special aid from science, the past abundantly shows.

In this country there have been established several experimental farms. Upon these farms, trials have been instituted to ascertain the relative value of various manures, but the results have not and cannot have any general or permanent worth. They have not been made with more insight, nor have they been calculated to clear up more doubts, than the single experiments carried out here and there by private individuals. It is true they have been executed with more care than is usual, but this has been so much more labor lost. The spirit which has established these experimental farms is worthy of the highest praise, but after they have existed here for years, we shall only reap the same fruits that have been gathered long ago in Europe, viz. a greater abundance of conflicting fragmentary facts.

I do not say that no good can come of them, I only express my belief that the results will be comparatively small, not at all commensurate with the outlay. Allusion is here had only to experiments upon the action of manures; with them, or others which from their nature involve chemical principles, the mere field trial cannot lead to definite conclusions, but in many directions of investigation the experimental farm can render most efficient service, especially in agricultural mechanics, a branch of pursuit which is now in its most flourishing condition.

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The other recognised means of making advance in agriculture is the chemical laboratory. It was in the laboratory that the foundations of agricultural science were laid, and it has therefore served a most useful purpose. There are still many subjects of considerable importance which the laboratory is competent to elucidate alone; but the larger share of the problems that now are needing solution, require the laboratory and farm to unite their resources.

There have been lately established in Germany, especially in Saxony, a number of so-called Experiment Stations, or experimental farms, with laboratories in connection, for the exclusive object of promoting scientific agriculture.

It is but a few years since the first of these was founded, now there exist already four in that little kingdom, and three others are in operation, or are being established in other parts of Germany.

These are intended to make science practical, and practice scientific, and no agency can be desired better adapted for these important purposes.

As mere practice is deficient in all that belongs to the province of science to suggest, so science alone lacks, that which practice is naturally fitted to supply; each is the complement of the other; rational agriculture is the result of their union.

The great laws that control vegetable and animal production being once established by pure science, science in conjunction with practice must apply those laws, must study their bearings, and follow out their details.

In the field and the laboratory then, observation and experiment are to reveal to us the new facts which shall be the materials for agricultural progress.

What is the field? This is a question which you, as practical men, know best how to answer. It is the touch-stone which decides upon the practical value of science; it brings every agricultural novelty to a trial that is decisive and final; it especially shows whether any plan or procedure be *remunerative*, and draws the line between what is theoretically possible, and that which is actually practicable. In the field we find the conditions which belong to, and are imposed by real every-day agriculture, and its ordeal is one which satisfies the most cautious and conservative.

What is the laboratory? In our time it is a series of apartments, stocked with strange apparatus, with vessels of the com

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monest and of the costliest materials, of the simplest and of the most complicate forms, with mysteriously-labelled bottles filled with every variety of compounds collected from air, earth and sea; some challenging the utmost admiration for their beauty, others exciting disgust by their offensiveness. In this mortar some substance is being pulverized to impalpable fineness, in that retort a just-discovered and yet nameless compound is undergoing purification; over yonder lamp a metallic crucible is glowing in a heat that would have blinded the eyes of Vulcan; in this row of tubes the masked ingredients of some rare ore are one by one revealing themselves—exchanging signs of odd fellowship with the presiding genius of the place, and yonder is a balance from which even "the fine dust" must be swept away when it is used, so delicate are its indications.

All these instruments are the chemist's tools; they are to him what the plow, the harrow, the cultivator and the reaper are to the farmer. As with their aid the husbandman gathers from to the farmer. As the husbandman cultivates his soil and gathers from it the fruits of the earth, so the philosopher harrows the seeds of inquiry into the field of nature, and reaps anon a harvest of truth.

What experimental science has won from the unknown she has acquired by these agencies. They have been, from the outset, her indispensable instruments, and must henceforth stand at her disposal.

In nearly all problems presented to the philosopher, wherein several different kinds of matter are included, he must have recourse to *chemical analysis*, which is the art of separation by chemical means.

Chemical analysis is one of the most precious fruits of the science of the last hundred years; it is one of the most efficient means of philosophical research, and figures more or less in almost every physical investigation of our day; at the same time its true function has been grossly misunderstood. This is the place to inquire into its use, to discuss what part it should act in any scheme for the advancement of agriculture.

So soon as it became an acknowledged first principle in agriculture that the nine indispensable mineral elements of plants are derived from the soil, and must be present therein if it is to be fruitful, great hopes were excited that chemical analysis, by pronouncing upon the presence or absence of these bodies in the soil, would become of immediate practical value. But

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these hopes have been doomed to disappointment, and although but a few years since, in this country, many soils were analysed, and many prescriptions for their treatment, founded upon analysis, were written, yet now we scarcely hear the subject mentioned, and that soil-analysis can be generally, or often, economically valuable, nobody who has the slightest actual acquaintance with chemical analysis can venture to maintain. The array of considerations that may be adduced in support of my assertion is quite too formidable to present here this evening; admitting, however, that the question is only as to the ability of chemical analysis, one reason may suffice, which is this: the quantities of soil-food which constitute abundance or want for the plant, lie beyond the limits where chemical analysis is able to reach; they are far too small for it to appre ciate quantitatively. Every chemist knows that in the finest kinds of analysis it is impossible to estimate with certainty quantities so small as the hundredth of one per cent. He further knows that in soil-analysis tenths of per cents lie at the limits of accuracy, i. e. it is impossible to determine by aid of analysis between two specimens of the same soil, one of which has been mixed with one-thousandth, and the other with two-thousandths of its weight of plaster or guano.

Now, it is not wide from the truth to estimate the quantity of soil in an acre taken to the depth of six or seven inches at 2,000,-000 pounds; one-thousandth of this is a ton. A ton of guano applied to an acre could not be estimated by the analyst, and yet we know that three or four hundred pounds is a large application!

To statements of this kind it has been replied, that we have balances capable of turning with one part in a million, why can we not determine millionths? It is true that we have such balances; chemists are in the daily use of balances that can be adjusted to this delicacy, but for a great variety of reasons it still remains for the present unalterably true that we cannot estimate less than thousandths. The hare must be caught before we can cook him, and substances must be separated, and converted into weighable forms, before we can bring them upon the balance. These processes of separation involve such loss, that many distinguished chemists do not care to employ the finest balances, because the unavoidable errors of analysis render their nice indications entirely superfluous.

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But although the farmer will but rarely, and by way of exception, have recourse to soil-analysis, the chemical examination of concentrated and costly manures is daily becoming more important.

There is every reason to suppose that the manufacture, it may be the importation of fertilizers will go on increasing indefinitely. It is needful that the consumer have some efficient means of protecting himself from fraud. Trustworthy analyses, made upon samples collected from farmers, constitute this means. It is not every farmer who buys a ton of guano or superphosphate of lime, that can afford to have it analyzed. The manufacturer or dealer has of course no lack of analyses and certificates, but there is no surety that what is sold to the farmer is the same in quality with the specimen that Dr. so and so has analyzed.

If however the manufacturer knew that every month or so, a new analysis of his manure would be published on behalf of the farmer; if he knew that the analysis would be executed now on specimens furnished by purchasers in Albany, now in Buffalo, now procured in Boston, now in Milwaukee, he would find himself compelled to be not only honest, but careful in his business, and the farmer could have perfect confidence in the genuineness of any fertilizer in the market.

So far, chemical analysis is of direct and tangible use, and may be useful in the hands of the mere analyst—of one who makes an analysis mechanically; but beyond this it is rarely of value alone. Beyond this, it is only one of the many appliances which must be used together to develope the great laws of agriculture, and its value will depend upon the purposes for which it is resorted to, and the skill with which it is applied to them.

Not half the chemical analyses that have been made with reference to agriculture have served any important use.

The fact that analyses are usually an essential part of an investigation, has led to the notion that they alone may constitute a research. But this is a great error. It is not sufficient to command one, or even all the means of arriving at truth. The field and the laboratory both, are valueless and dead, until they are breathed upon, and inspirited with thought; until they become the servants and ministers of mind.

The laboratory must be not merely an analytical laboratory. Its furniture is not complete so soon as it is equipped for

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repeating what has been already done. It does not suffice that soils, manures and their products, vegetable or animal, be analyzed according to the received methods.

We will open paths and thoroughfares into the unexplored forests of truth. The ground is rugged, and the pioneer cannot hope to lay a rail-way before him—cannot expect to travel in the usual easy style. As he progresses he encounters all manner of obstacles, so that the analogy we have taken up ceases altogether, and his engineering can find no parallel. He is often obliged to hew each step of his advance not merely in the adventitious ice that would melt away in the warmth of substantial encouragement, but in the primal granite of the everlasting mountains themselves, whose heights he aspires to climb. He encounters swift-flowing rivers of phenomena in whose commingling waters he loses his trail utterly. He must ford them, and from the heights on the other side look back, take fresh bearings and renew the pursuit.

As the cast-away spider that has fortunately landed upon some larger pebble, lying dry in the bed of the brooklet, spins out a silken filament into the breeze, until its floating extremity catches on some object on the shore, and thus bridges the water—so the philosopher must often trust himself to slender hypotheses to furnish a crossing to otherwise impassable ravines.

It is the deed of thought and patient study to strike out the path; but to make each step of it accessible and sure, is a work demanding the co-operation of material aids, and the laboratory must place at the disposal of the investigator, if not the actual instruments for accomplishing his various objects, yet the means of constructing them, as his invention shall dictate.

The laboratory must not be merely the chemical laboratory. The scientific attainments of the agricultural investigator must not rest with chemistry. The influence of the physical and physiological laws that so widely rule in nature, must be appreciated by him. They are equally important parts of the great system which he should seek to develope in all its harmony and completeness.

I have thus briefly and imperfectly touched upon some of the more salient points of the method that agriculture must employ in tracing out those principles whose knowledge cannot fail to yield her the goodliest fruits. The method how-

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ever cannot be fully considered independently of the ends, and we shall therefore recur to this subject incidentally in the remarks that are to follow—where we shall find opportunity to illustrate it, by actual example.

I would like now to notice at length the results that have been obtained, but our time is insufficient to consider in detail the efforts that individuals or societies have made to develope the science of agriculture. We must be content to notice a few of these, and will then speak briefly of such results as have figured prominently in its recent history.

It was the issue in 1840, by Liebig, of his classical work "Chemistry in its applications to Agriculture and Physiology," that first gave a decided impulse to agricultural science. In that book, its distinguished and gifted author, subjected all that had accumulated on this subject in agricultural literature, to the most searching and conclusive criticism. He swept away from the few kernels of truth, the heaps of chaff in which they lay buried, and with the aid of the numerous new investigations which had been made by himself, and under his direction, he was enabled to establish agricultural science on a sure basis; and however much he has been criticised, misunderstood, and even maligned, to-day his works are the source where the scientific man must seek the deeply laid foundations of this science. Liebig wrote as a *philosopher*, at the request of the British *Scientific* Association, a treatise addressed to *scientific* men; but his vigorous and popular style, and the novelty of the system he presented, found for his book friends among practical men, and had the effect to excite a demand for special institutions charged with developing and diffusing the new doctrines.

It was Great Britain especially that from its peculiar circumstances was fitted to be the country where this new development should begin, and go on most vigorously. It was there that the density of population, the extent of manufactures and the abundance of capital, made and make agriculture more profitable than in any other land.

There too Davy, thirty years before, had applied his brilliant genius to this subject, and in 1838–40, Dr. Madden and the late Prof. Johnston had begun to recall attention to it.

Until the year 1843 (I believe), nothing had been done of very great importance in any country, by associations of practical men. In that year the Scottish Agricultural Chem-

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istry Association was formed. It was contemplated indeed to last only five years, but during that time, under the able direction of Prof. Johnston, greatly enriched the practice of Scotland, and has contributed largely to the science of agriculture. The enlightened agriculturists of Scotland were not satisfied with a five years trial, for as you are aware, in 1849, the Highland and Agricultural Society—which from the outset had warmly supported the Agricultural Chemistry Association, assumed the responsibility of carrying out its objects, on even a more liberal scale, and from that time to the present, the researches of Dr. Anderson, its accomplished chemist, have justified the patronage thus bestowed.

England has not been backward in this work. Her Royal Agricultural Society has employed Playfair and Way, in very extended and very useful labors.

Each of these societies expend annually two or three thousand dollars in support of their chemical departments, which have become indispensable to British agriculture.

The fame of the great field experiments of Mr. Lawes, has reached wherever an agricultural journal goes. Boussingault in France, Kuhlmann in Belgium, the chief agricultural schools, and the already mentioned experiment stations of Germany, complete the list of greater lights. But in Europe there are a host of individuals, mostly teachers in the universities and industrial schools, whose aggregate contributions to the details of agricultural science, are of great extent and importance.

Of the results of special investigations in the department of agricultural science, allow me to instance a few. Fifty years ago it was known as it is now known, that plants require various conditions for their growth, and the general nature of these conditions was understood A soil, manure, water and warmth, have in all time been recognized as essential to vegetable production; but it was not known *what* in the soil or manure, was needful for the plant in general, much less in special cases. Almost within the last twenty years have we learned what is the composition of the soil and of the plant; learned the sources of the food of vegetation; learned what are the active ingredients in fertilizers; how these may be most easily and cheaply supplied to the plant.

Now we understand to a good degree the causes of barrenness or fertility in soils, the causes of their exhaustion and

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the nature of that process, how too the soil may be renovated or reclaimed.

We have made considerable progress in the knowledge of the composition of the individual products of our fields, and are beginning to know with some certainty how to apply them judiciously to the realization of animal products. We have a foundation of firmly established truth in nearly every department of agricultural theory.

Among recent labors, there have been some attempts to settle by rigid quantitative experiments, the question whether plants are capable of deriving nitrogen directly from the atmosphere. This is an important subject. From all we have hitherto known it has been decided, and this is Liebig's doctrine, that all the nitrogen contained in plants is derived by them, not from the free nitrogen which constitutes four-fifths of the atmosphere, but from the comparatively small amount of ammonia and nitric acid contained in the soil, in the air and in the atmospheric water.

Some have thought that beans, clover and the leguminous plants in general, are able to assimilate free nitrogen; but this idea had no substantial basis. This subject has been recently taken up by two able French chemists, and their results are a capital illustration of the difficulty often experienced in the study of subjects purely scientific, and not complicated by practical conditions.

Mons. Ville, one of these chemists, published the results of an extended and laborious research, which seemed to prove beyond all doubt that various plants, wheat, tobacco, lupines, &c., *do* possess the faculty of directly appropriating free nitrogen from the air. The manner of conducting his experiments was as follows:

He enclosed the growing plants in a little crystal palace—an air-tight cage of iron and glass: he then supplied them daily with a determinate quantity of air, from which all ammonia and all nitric acid were carefully removed; the soil and pots in which the plants grew were also free from nitrogen, or the quantity therein was accurately determined. He estimated, at the outset, the nitrogen contained in as much seed as he sowed, and at the expiration of the experiments, which continued several months, he analysed the total produce. He found the harvest contained a quite appreciable quantity of nitrogen more than it could have derived from

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the seed, and, so the result would seem, more than it could obtain from any source, except the free nitrogen of the air.

At the same time, however, Boussingault was occupied with the study of the same question. His plan was to sow seeds in a vessel of glass so large as to supply the plants for several months with atmospheric food, without the need of renewing the air. His trials were conducted with no less accuracy than the others, and had the advantage, so he urges, of avoiding certain sources of error incident to the method of Ville. He found that the harvested plants contained just the same amount of nitrogen that existed in the seeds he had sown, and concluded that plants are incapable of assimilating uncombined nitrogen.

A commission was appointed by the Paris Academy, consisting of the ablest philosophers of that metropolis of science, to investigate the merits of these two conflicting trains of research, and so far as I have been able to learn, the question lies open still.

But this point can be settled, and must be settled soon; its study will not be given up. You may ask, what is the use of all this trouble, what the use of knowing whence the plant derives its food, so long as it gets it? I answer, the student of nature believes in nature's unity; believes that she is a plan devised by the highest intelligence; believes she is in every sense an economy; that each fact in her constitution is related to all the others, and that a knowledge of one part of her system must of necessity, to a certain degree, reveal and illustrate the others. Therefore these researches ought to be prosecuted.

In regard to some questions of high practical interest connected with this same important element, nitrogen, investigation has led to positive results. The experiments of Mr. Thompson and Prof. Way, mostly made in the laboratory of the Royal Agricultural Society of England, have shown that every tolerable soil possesses a faculty of absorption—for ammonia especially—of a kind and degree previously unthought of, so that it is almost impossible that the soluble constituents of manures leach out of the surface soil to a depth beyond the reach of the roots of plants, and the farmer need not fear that his soil, if well and deeply tilled, will suffer anything to go lost in this way, that he may apply to fertilize it.

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It is well known that lime and ashes, or alkaline bodies in general, can not be mixed with decayed animal substances, or other matters containing ammonia *ready formed*, without expelling that ammonia, and greatly diminishing their manurial value. Well informed agricultural writers have therefore asserted that lime must be kept out of compost heaps containing nitrogenous substances; that it is chemically incompatible with nitrogen.

But the recent exact experiments of Payen have proved that while lime decomposes ammoniacal bodies and causes loss, it exerts a wonderful preservative power on nitrogenous bodies, whose nitrogen has not been converted into ammonia, but which, under ordinary exposure, passes spontaneously into that body, and goes to waste. Fresh-slaked lime may therefore be mixed with fresh animal excreta, or refuse matters, to prevent their losing nitrogen. Payen has further shown that when such undecaying mixtures are exposed to water and carbonic acid, then decomposition begins and ammonia is formed. This is precisely what occurs, and what is wanted in the soil.

It is true of many of the results of recent study which have agricultural applications, that they have accomplished far less than they have suggested; many investigations which have been originally planned to clear up some seemingly defined and limited subject, have mostly had the effect to make our ignorance more painfully plain. Indeed the student of agricultural science constantly encounters the problematical, through which our knowledge shades off into the unknown, and hundreds of new questions present themselves for investigation at every stage of his progress.

As a specimen of the subjects which may profitably employ the united efforts of science and practice, and at the same time to illustrate further the method of investigation, let me sketch, in brief outline, a plan of inquiry into the special conditions which most favor the production of our usually cultivated plants. This, you perceive, is a very large subject; it involves all kinds of conditions, botanical, physiological, physical, meteorological and chemical; but if it were proposed to take up a part at a time, and, for example, to study only the chemical conditions, we should be led to conclusions scientifically incomplete and erroneous, and practically unsatisfactory, unless the influence of the other condi-

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tions were taken into the account. It is a sufficiently *important* subject, for these conditions affect our national wealth and prosperity to an incalculable extent. It is important that this matter be investigated, because we are greatly in the dark; because we find our predictions, founded on the best knowledge we possess, are constantly failing; because results are constantly met with which we cannot explain; furthermore, it should be studied vigorously and extendedly, since there is every reason to hope that it may be in good degree cleared up, and brought within our control.

It is, too, a subject adapted for the efforts of a large society like yours, for it is of universal interest, and it can be elucidated only by facts and experiments gathered from distant and various sources. It involves new studies in four directions—first, relative to *soils*, the nature of their differences, especially their physical properties, the influence of tillage, &c.; second, relative to agricultural *plants*, their peculiarities and special wants; third, relative to *manures*, the method and causes of their efficacy; fourth, relative to the *weather* and *climate*.

Suppose, now, that the New-York State Agricultural Society, after due consideration, had resolved upon attempting to enlarge our exact knowledge on this subject. It should provide a *laboratory* for the scientific part of the inquiry, and call upon its enterprising members throughout the State to cooperate in contributing results gathered from the *field*. A series of circulars should be distributed, describing schemes of observations and of experiments to be instituted, comprising lists of questions to be answered, and a statement of objects to be attained. Interested practical men should be engaged to fill up and return these circulars.

Time will allow me to go into details only with regard to one small part of such an inquiry, viz., the influence of the chemical composition of the soil, including manures, upon the profitable production of our cultivated plants.

This study is to be conducted by growing the plants upon various soils, and comparing the peculiarities of chemical condition, and the quantity and quality of produce in each instance.

Let us propose to examine the influence of ammonia and of phosphoric acid; this is the most interesting part of the subject, because upon it Mr. Lawes, of England, has brought to

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bear his great experiments; it is the most important, because ammonia and phosphoric acid are the rarest, and therefore the most precious fertilizers.

Mr. Lawes gives, as the result of his trials, that ammonia is specially adapted to the production of wheat, and phosphoric acid to that of turnips. We shall see presently some reasons that may excite doubts as to the necessary truth of his conclusions.

There are many circumstances that will affect the issue of an experiment; these must all be considered with the greatest care and minuteness. Let us see then. Our field experiments must be made with the various crops, manured with ammonia and phosphoric acid. If we compare the results of trials on the action of these substances that are already on record, we can arrive at no satisfactory conclusion, for we find them at variance; some, perhaps, are directly opposed to others. This comes from the fact that undetected conditions have been present in one case that were absent in the other, we must therefore contrive our experiments so that the influence of every possible extraneous condition be eliminated. This is accomplished by making all the conditions precisely alike, except that one whose influence we propose to study. For example, to eliminate the effect of climate from the problem we are now considering, it is necessary that a series of trials be conducted on similar soils with the same plants; with the same manures, used in the same quantity, and with the same tillage, but in such different localities as shall ensure various climatic circumstances. We must have results from our northern cold countries, from the lake shore, from our great river valleys, from the warmest south, and from the sea-board. The differences that we find will thus be clearly referable to the differences of climate.

To test the effect of weather, which is the climate of the year or season, we must extend our observations through successive years, and record all along the varying temperature, rains, sunshine, &c., other things remaining as nearly as possible equal.

In the same locality, under the same sky, watered and warmed alike, the same plants must be cultivated in the same manner, on soils having *different physical properties*, such as color, porosity, tenacity, absorptive power for heat, for water, for manures, all of which properties must of course be

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fully examined, and reduced to numerical values. Again, in another instance, all things must remain alike, except the methods of tillage and cultivation, thus *their* effects will reveal themselves.

In the study of the *manures* much care should be used, and the *various forms* or compounds of ammonia and phosphoric acid, or their agricultural equivalents, should be applied in parallel experiments. It would be only repeating an old blunder to manure a field with superphosphate of lime, and ascribe the result to phosphoric acid. In such a complex fertilizer the function of each ingredient must be ascertained, and generally the influence of the solubility, the time of application, the quantity used, &c., &c., must be brought out by specially devised trials. Such experiments being carried out by farmers in various localities, some contributing in this line of inquiry, others in that, according to their ability and interest, and all on a prescribed and uniform system; the plot of ground carefully measured, the seed weighed, and the yield carefully estimated; then the laboratory would be called in requisition to decide in its province upon the quality of produce, and the peculiarities of condition.

Even the great experiments of Mr. Lawes are not extended enough to warrant the conclusions that have been drawn from them. The influence of the physical properties of the soil he has not eliminated in his solutions of the ammonia and phosphoric acid problem. His trials were made on one soil—at any rate not on many soils—and the success with which his neighbors apply his recipes proves nothing, for their soils are too much like his; and though similar results have been obtained on soils of a widely different character, yet there are other trials on record which refute his conclusions. His trials do not show the effect of different quantities of manures, because he has published no series of results sufficiently unaffected by other conditions. We know very well that too large quantities of saline manures hinder, or even destroy vegetation, especially in dry seasons. We, ourselves, may eat sugar by the spoonful, but only sprinklings of salt. We know what happens when we swallow salt by sugar measure. And there are other radical defects in the method of his investigations. I think that much of the support which his views have found in practice, is connected with the system of culture adopted in England. Where the sheep and turnip

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husbandry prevails, we find a certain uniformity of tillage, rotation and manuring, the effect of which has been to make the soils of those districts similar to each other in many important particulars; they suffer alike, and are improved by the same means. But I do not wish to criticise; it is not hard for the gnat to sting the lion. It is easier in 1856 to show that here and there Mr. Lawes has blundered, than it was in 1840 to lay a faultless plan; vastly easier than to execute it.

Though Mr. Lawes has made mistakes, yet he has done enough to be the world's example, and, an individual, has accomplished more than any society.

It is our duty, however, to build on sure foundations, and the rubbish must be cleared away, down to the very granite. No crumbling bricks or untempered mortar, though laid by the hand of a Lawes, or even of a Liebig, can endure, in the walls of the great temple of truth. What they have done well, will be the eternal witness of their fame.

I regret that time does not allow me to enter more into the details of such plans for extending our knowledge. You see, however, that the method I have roughly sketched, must inevitably lead to good results, whose number will only be limited by the zeal and skill that we enlist in these great inquiries.

Not merely will they be of immediate influence upon our noble science of agriculture—opening to us the mysteries of nature's workings, but, as always happens, the increase of knowledge will react on its diffusion.

Since the telegraph has spun its electric net all over our land, who does not know the story of Galvani. At its first introduction, what an interest was excited. The old of all professions and callings, felt that they lived in an advancing time, and were ashamed to remain behind. So it will be with agricultural progress. The interest aroused by the very endeavor to discover the new, will vitalize the old. Every field whereon one experiment is made as part of a great system of investigation, will compel each passer by to examine the nature and objects of that system. It will create among farmers, a thirst for agricultural information, just as the sight of a confectioner's shop makes boys hungry for sweet-meats. The intellectual life of the farmer will become more vigorous and healthful. He will cease to be mechanical and prejudiced,

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and more nearly attain to the true dignity of a wide-seeing and deeply thinking man.

These special studies carried out on an extensive scale will have the effect to make agriculture appreciated as a profession. Educated young men will be attached to it as an intellectual pursuit.

Finally, the influence of special agricultural inquiries, prosecuted as I have mentioned, will be to modify and reform our existing practice generally.

The unprofitable and even wasteful management, now not rare in our State, will give place to a more judicious and rational system, conducive at once to the prosperity and the beauty of our country.

I am sufficiently conscious that in the considerations I have presented this evening, hastily thrown together in the few moments of leisure various pressing engagements have afforded me, I have not been able to unfold my subject in anything like an adequate manner. My duty however before this audience has been rather to suggest than to go into lengthy details. Your own reflections will fill up the picture I have attempted to sketch in outline. I have full faith not only that science *may* accomplish much for agriculture in the way I have indicated, but that she *will* speedily be put about the work. The tendencies of our time prophesy this. The notion that there is anything essentially antagonistic between science and practice is daily meeting its refutation, both in the laboratory and in the field.

I may confidently ask, where better than in our own country shall this idea find its realization. The scholars of Europe often say to the American: science can only flourish under the patronage of Royalty. But they mistake—our country, just arrived at manhood, has indeed been so absorbed in its own growth, that it could ill spare effort for great scientific achievements, and yet within the last twenty years, even the self-complacent philosophers of France and Germany have been obliged to be amazed at the contributions to science we have sent over to them from what they are pleased to call our back woods.

What state of the old world has published for its *people* so splendid a work as our Natural History? Which of their capitals may boast so splendid an observatory, as this city is to have? Who has equalled our Spencer in perfecting the

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microscope? What country has done more for meteorology than the Empire State? There is in no library in the world another work like the "Meteorology of New-York," which Dr. Hough has recently given to science.

In Entomological science I know no instance of government patronage like that which has sustained the admirable labors of Dr. Fitch. It is true the king of Prussia has caused to be written a valuable work on insects injurious to the forest trees of Germany, but the German forests are direct and indispensable sources of revenue to German Princes. The agriculture that gives the people bread is not thus protected.

Our country now has the strength of the oldest nations, with all the freshness of youth. She is girding herself up to contest among the nations for the prizes of science. What worthier triumph for our Republic than to win for her millions the boon of a rational agriculture?

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ADDRESS,

DELIVERED BEFORE THE

NEW-YORK STATE AGRICULTURAL SOCIETY,

AT ITS ANNUAL MEETING AT ALBANY, FEB. 15, 1856,

BY SAMUEL CHEEVER, PRESIDENT.

GENTLEMEN OF THE STATE AGRICULTURAL SOCIETY:

The close of this agricultural year brings with it much cause of gratitude to the great Author of our existence, and author of those mysterious but unerring laws of production, which give support to the animal world, and, aided by human skill, give sustenance to the great family of man.

We have had neither war nor pestilence, and instead of famine, the year has been emphatically crowned with abundance.

But whilst pestilence has spared us, it has been doing its work of death with a heavy hand, upon the towns of some of our sister states, from which appeals have come up to our sympathies, which have been responded to by our religious communities and our commercial towns, in a manner creditable to christianity and to philanthropy.

War, too, has had a busy year, but at a point so remote, that we have felt little of its immediate effects, except in the improvement in our markets.

The holding of our fair and cattle show for the first time in the southwesterly part of the State, has resulted as advan tageously as its strongest advocates anticipated. Those who had not before visited that district, found much there to interest them, and much to admire; and those residing there, who had not before had opportunity to see such an exhibition, found much to entertain and instruct them, and much that they will doubtless endeavor to imitate.

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Exhibitors from almost every part of our own State, from the adjoining and even from remote States, came forward, with a commendable spirit, to fill up the several departments; and they were met by the people in that locality with a well directed liberality, in fitting the grounds with their appointments, and also with a hospitality in their personal accommodations, generous in its character, and ample in its extent.

The exhibition was highly creditable to the exhibitors and to the society, and was, it is believed, gratifying to a crowd of visitors, not the largest, but among the largest, that have attended our fairs. The financial accounts have all been arranged with the local committee there, and closed in a manner highly satisfactory to our Executive committee; and I have the satisfaction to state, that the finances of the society are again upon the ascending scale.

As this society is the only medium through which the farmers of the State can act unitedly, I propose to make some suggestions tending to show the relation in which, as a class, we stand to other classes, and other interests, with which we are connected. As a working farmer and a tax payer, in a small way, my attention has been called to things passing about me, which affect me more or less, in common with others of the State, of some of which I propose to speak. It is a fact so often stated, that I need not repeat it, that our agricultural interest is the most important in the country. Next in the order of importance, is our manufacturing interest. Without these, and the consumption of merchandise by those engaged in them, commerce would have little to do. Statistics show an amount annually *created* by our agriculture greatly beyond that *created* by any other agency, if not more than by *all* others in our land. It *creates*, because it draws from the earth and from the atmosphere that which, but for it, would not be produced.

The mechanic and manufacturer increase the value of material, by converting from one article to another, and enrich the country by the difference in value before and after their operation, whilst agriculture enriches by the full value of its production.

The carrier by land or by water increases the value of his freight, by transporting from a point of lower market, to that of a higher.

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The buyer and seller adds nothing to the value of the commodity, but makes his profit, generally the largest in the list, from his schemes of buying low and selling high.

The Secretary of the Treasury of the United States, taking our agricultural productions from the census of 1850, and calculating the increase for the last five years, estimates the product of 1855, in the United States, at over sixteen hundred and sixty millions of dollars.

This, in the first place, feeds the population producing it, and then freights the rail cars, the canal boats and river crafts, on their way to the ocean, and pays the freight and the tolls, and then in a great proportion, freights the coasting and outward bound vessels in our merchant marine. The agricultural population consumes, and of course pays for a large portion of the merchandise which forms the return freight of all these carriers.

This immense created wealth, and immense consumption of merchandise, furnish mainly the material for the whole mercantile operations of the country; and they also furnish the basis for sustaining our banking institutions, and our financial exchanges: indeed, the latter are but a part of the great machinery necessary to carry forward the work of the tillers of the soil, and our manufactories.

If any one should think this an overestimate of the importance of our agriculture, let him calculate the consequences of withdrawing from a commercial town, for instance, the city of New-York, the productions of that agriculture, in all its departments, and also the merchandise taken and paid for by the agricultural population. A very few houses, compared with what they now have, would accommodate all the people who would have any thing to do there.

These suggestions are not made in a spirit of vain glory or boasting, but that we ourselves may properly appreciate the importance of our position, and the responsibility which that importance devolves upon us; and that men of all other classes and in other pursuits may see the importance of giving encouragement and aid to a pursuit of so much prominence in the great whole of human employment and human sustenance. Such a pursuit certainly should not fail to command the attention of our legislators and our statesmen, and of every one to whose keeping the great interests of the country have been confided.

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But in the sharp struggles for special advantages between different interests in our country, of which our National and State Legislatures have frequently been the scenes, this interest, preeminent as it should be, has been too often overlooked or disregarded.

As this has occurred before, it will likely occur again, unless, from some united action of ours, we shall take means to have the farmer represented there; so that while other powerful interests are active in legislating themselves up, the farmer shall not be legislated down.

Some suggestions are now before Congress, from the Secretary of the Treasury, which, if carried out, will act injuriously upon our agricultural interests, and most specially so upon our sheep husbandry.

As one of the means for reducing the revenue, arising from customs, the Secretary proposes to take off the duty upon such articles as are used in our manufactories, which he says will reduce the revenue, and tend to give the manufacturers the *home market*.

This will withdraw from the farmer the protection of thirty per cent, which he now enjoys, upon his wool, his hides and his flax seed, whilst the manufacturer retains the same protection upon his goods.

The agricultural population of our country consume more than half the woolen goods manufactured in it. They are in numbers as a hundred to one of the woolen manufacturers.

This State, in 1850, by the census tables, produced more than ten millions pounds of wool, which has probably been increased to twelve and a half millions in 1855. This was in value more than five millions of dollars. Thirty per cent on this is one million and a half of dollars. This is to be taken out of the farmers of this State annually, so as to secure to the manufacturers of woolens *the home market*. It is mockery to say the price of wool is not to be reduced. How is it to give the manufacturer the *home market* unless he is to buy our wool cheaper? In the compendium of the census of 1850, page 179, the superintendent says that forty-three per cent profit has been made upon the capital invested in the manufactures in this country, including real estate, raw material, fuel and labor, giving the amount of each. Capitalists are unwilling to invest in agricultural property, because they cannot realize seven per cent. Suppose this scale of profits

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were reversed, what would be thought of the farmers who were making forty-three per cent profit, if they were to ask to have that profit increased, and to have that increase taken from a class now making less than seven?

The practical effect of this measure of the Secretary, if adopted, would produce this striking inequality and injustice. The farmer is to be compelled, from foreign competition, to sell his wool to the manufacturers thirty per cent less than he now does, because protection is taken from him, and when he turns round to purchase back the same wool in cloth for his family, he is to pay to the manufacturer thirty per cent for protection, not only on his labor, but on the very wool which the farmer has been compelled to sell him without protection, and which constitutes full one-half the value of the cloth. The same principle holds when the farmer buys his shoes or his harness, made from his hides, or his oil, made from his flax seed. It is to be remembered, too, that this wool and these other raw materials are as much the "productions of American labor," as the other parts of the manufactured article. If this is not an instance where "the rich are to be made richer, and the poor poorer," it will be difficult to find it. We sometimes differ upon the question of protection in the abstract, but we must be endowed with a high order of disinterestedness, to yield our approbation when this protection is all against us, and nothing for us.

In this invasion of our rights, we have an evidence of the power of united action, when supported by associated wealth. This power the farmers possess less than any other class. They are isolated in their local relations to each other. Their individual means are generally moderate, and they have no associated wealth.

In a contest, therefore, for legislative advantages, between different interests, they are in a condition less likely to be taken care of than any other class. They will remain so until means can be adopted, with them as with others, to produce unity of action where there is unity of interest.

Combination, or united action, has become a prominent feature with almost every class and every interest with which we are connected, and unless we join in the system, we shall be sure to fall behind the times. Such combination is, of course, formed for the benefit of those adopting it, and it follows, that in proportion as *they* are benefited, some body else is damaged.

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Many of them are made to act more or less injuriously upon our farming community. I do not complain of it, but refer to it to show what others have done by *united* action, where individual effort would have been powerless; and also as an example, which we seem called upon to follow, in self defence.

I will instance the great forwarding lines upon our canals, rivers and others, where compacts are formed and a tariff of prices fixed, for the transportation of the produce of the country to market. This deprives the farmer of all the benefits which he might otherwise derive from competition. It is decided in convention, where the farmer is not represented, how much less his ox, his sheep or his barrel of flour shall be worth at any point in the country than at the Atlantic. That decision is the law of the case.

Again, when the feeder goes with his cattle to market, or they go by the drover, he finds a cordon of middle men or brokers drawn around the market whose "*sound dues*" must be paid before the butcher can be reached. Then at the last, the butchers themselves are found united upon a "common law" regulating the time and mode of payment, which again embarrasses the seller and subjects him to further discounts.

The farmer also finds he is compelled to pay almost double for his salt to what he formerly paid, for the use of his farm. On inquiry, he finds the boilers at Syracuse have been legislating upon the subject. They have fixed the quantity to be produced, which is known from experience to be within the demand, so that competition shall not bring down the price. This idea was probably not original with them. It is matter of commercial history, that formerly, when the Dutch East India Company owned largely of the spice islands in the Mediterranean, if they found a large crop had been produced, they had an account taken of it, and all beyond a fixed amount was *burned*, that the price should not be depressed by a flooded market.

Association and united action has enabled the mechanics and laborers in our large towns and villages to regulate their own wages and their hours of labor, and to compel compliance from their employers. On visiting a farmer, residing nigh a town or village, in summer, and finding him erecting or repairing his buildings, you will see him and his sons and his farm laborer going to the field at the rising of the sun, and leaving it again when the sun goes down. But the mechanic who, from

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association and *combination*, has constituted himself one of a *privileged order*, does not advance to *his* work until the sun has shone upon him for an hour or two, and then leaves it again as many hours before the farmer at night.

Laws have several times been introduced into our Legislature, limiting the time of all hired labor, to ten hours per day. A law now exists limiting it upon our public works to that time. It will probably trouble you to understand why a man, promoted to the rank of *state hand*, should work for you upon your public works less hours than you yourself do upon your farms. Efforts will undoubtedly be renewed, to carry this regulation or this law to the farms. The effect would be almost fatal to our interests. It is safe to say, that with the ordinary price of our farm produce, the farms of this State could not be worked and pay expenses, even without interest, if the farmer and his sons and his men worked, on present wages, but ten hours in the day. For instance, what would be the fate of the dairyman, who started with his men for the yard to milk his cows, at seven in the morning, and then drove them from the pasture at four or five in the afternoon, that all should be done before six, under the penalty, if not then done, of being left over?

Probably, too, full *one-fourth* of the hay and small grains, harvested in this State, are housed after six in the afternoon, when the mechanic quits work; and more than *one-half* those crops are housed after three o'clock, the previous part of the day being necessary to prepare them for housing. Under a ten-hour system, on the farm, all left out after six o'clock, must remain out and take the storm, unless extra pay is given.

The practical result of this system, so far as it has already gone, is, that those of the *privileged orders* and their families feed upon the produce of the farm, working but ten hours per day, while the farmer and his family, producing it, work twelve to fourteen.

This system operates to the prejudice of the farmer when he employs the mechanic, just in proportion to the reduction in hours, and that too whether the work is done by the day or by the piece. It does not enrich the mechanic, for his weekly earnings are not increased, but he secures to himself an easier life at the expense of his employer.

But such combinations to force up the price of labor have their evils for the mechanic as well as the employer.

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Increasing the price of an article diminishes its consumption, and of course the demand for it. More flour is consumed by the same population at $6 per barrel than at $10. More houses will be built and more labor called for when twelve hours can be had for a day than when but ten can be had. The rent of the mechanic, too, is raised in proportion as the cost of his house is increased. The capitalist will not build unless he can adapt his rents to his outlays.

These high wages and short hours also invite mechanics in from the country, and especially from across the water, so that whilst the demand for work is diminished, the number to do it is increased.

Then, in case of a commercial revulsion, its consequences act back upon the mechanics and laborers themselves, with fearful severity. Of this, the scenes presented in the city of New-York, a year ago, furnish most melancholy testimony. Processions, embracing thousands of mechanics and working men, mostly of foreign nationality, but many of native birth, were thronging the streets, asking work and asking charity, presenting in themselves and in their families, instances of want and suffering seldom seen by an American eye. Thousands of those men and their families would not have been there at all, to aggravate those miseries and to share in them, had they not been drawn there by the high prices which had been forced up by artificial means, to a point they would not have attained by the safe and salutary laws of supply and demand.

Another instance may be referred to, where the State has been brought in to pay very dearly for united action in the same quarter.

The mechanics in New-York, several years since, started the idea that some branches of labor, done in the State prisons, interfered injuriously with their business. Little pains were taken to ascertain whether the complaints were well founded or not. Probably had correct statistics been taken, it would have been found that all the articles produced there in the branches complained of, did not amount to one per cent on the quantity produced and brought into market from other sources. Yet they were persistent, and by *united* action obtained a conquest. There were strong *legislative* reasons for gratifying the petitioners. The members representing the agricultural districts, by far the largest tax paying, yielded. A law was passed to purchase an iron mine in Clinton county and build a prison

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where the convicts should not make shoes, boots and barrels, to break down the mechanics of New-York. The consequence has been, that more than three-quarters of a million of dollars have already been drawn from the treasury to build that prison and sustain it, with the prospect of a longer if not a perpetual drain.

This is to be met by direct taxation upon the real and personal property of the State, where the farmer always enjoys the "*lion's share.*"

Had this money been in the treasury a year ago, it would have saved that proportion of one and three-quarters of a million which we are paying this year in direct State tax to sustain the canal finances, or, in other words, to sustain the State treasury.

These are some of the instances where the *united* action of classes and interests have been brought to bear more or less adversely upon the interest of the farmer.

I would not counsel *united* action or any action for purposes of aggression upon any class or any interest, but it is worthy of inquiry whether we are not called upon to take some action for self-protection. We are certainly admonished that if we do not take care of ourselves, no other class will do it for us.

One thing should we always bear in mind, that whenever the men in our Legislature talk of taxation, either upon State, county or town, they are pointing to the farmer. He pays more than half the State taxes, and, except for municipal purposes, a much larger proportion than all others.

EMIGRATION TO THE WEST.

Another subject worthy of consideration, as affecting our agriculture, and affecting the value of our lands, is the emigration of our farmers to the west. This has already gone so far in some of our counties, and they too of considerable agricultural excellence, as to diminish their population from one census to another.

An opinion prevails that it is better to go beyond the lakes and purchase the rich prairie lands to make more crops than to improve our lands here to do it. This, when well considered, will, with some few exceptions, be found otherwise.

Two classes of men may advantageously go to the prairies to farm it. The young man without means or with small means, and the man with few acres and with several sons, intended for

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the farm, and who can sell his few acres here for enough to purchase many more there. But they must both take into account the risk of health for themselves and families, and especially whilst turning up the new prairie, filled with carbonic acid gas, and bringing the land to cultivation. They must also be prepared to encounter physical hardships, and to submit to self-denials and social privations for a considerable time.

But the farmer with a different family, in comfortable circumstances, on a farm, of even moderate size, in a good part of this State, should count well the cost before he leaves it, together with his religious and educational privileges, his social circle, and above all, before he severs the ties of kindred for the sake of more acres, even of good land upon the prairies, and especially as those acres are from six to ten hundred miles from his market.

There are many discounts upon the investment in prairie farming, which I am satisfied are not often taken into the calculation and which will not be apparent until the account is stated.

The land, especially the new prairie, in the interior, without railroad or canal accommodation, is purchased at a low price and is easily brought to a producing state. Here, *cheapness* in getting a farm ends. When the owner proceeds to build his house, his outhouses and his fences, he finds the cost nearly if not fully double what it would be here. His timber is to be purchased at a high rate and often at a remote point, frequently to be carted a journey of several days. His mechanical labor and all other labor are at a high rate. Brick, stone and lime, have the same high range of price. These improvements, even here, enter largely into the cost and value of our farms, but immensely more so there. There, unless the settler upon the prairies is fortunate in his location, the water for his farm and his family will be of doubtful supply and doubtful quality. The pure running stream is seldom seen there. The orchard and garden fruit are to be planted and waited for, as well as the shade tree. For milling, a long distance is generally to be traveled, unless steam or the wind are looked to for power. Religious and educational privileges are to be begun anew when a settlement is made about him numerous enough and willing enough to help him.

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All this and much more is he to do there before he reaches the point of domestic and social comfort which he leaves at his nome in New-York.

When this is done, the great detracting feature in the case still remains to tell against him, and that is, *his distance from market.*

If he is in the interior of Michigan, Illinois, Wisconsin or Iowa, and at the distance of thirty miles from navigable water or a railroad depot, the transportation of a bushel of wheat or corn to the Atlantic market, where it comes, will be from 45 to 55 cents, and in like proportion upon other grains.

In the production of beef and pork, upon a large scale, the prairie States have a decided advantage over the east, and will continue to hold that advantage, especially for beef, so long as the use of the rich prairie grasses can be had, without ownership and without rent; and they will *always* hold that advantage in a degree, from the less value of their grasses and coarse grains at home compared with ours.

But even in these articles, remoteness from market still meets the owner. The transportation of an ox from these States to New-York costs from $7 to $10, besides the waste. This amounts to about $2 per year on the growth of the animal, and in equal proportion upon the sheep and the hog. This tends so far to bring up the eastern farming to an equality, in these branches of husbandry, with the western.

For the purpose of comparing farming in this State with farming in the above prairie States, I propose partially to state an account upon some of the crops common to both, as figures are more to be relied upon than mere assertion.

A prairie farm, situated as above, is now worth, when brought to cultivation and fenced, with suitable farm buildings (which latter are very rare), from $15 to $25 per acre, say an average of $20.

The average crop of wheat there is about with ours in our wheat counties, say 17 bushels per acre. Their rate of interest is higher than ours.

Charge then for interest on cost of land there at $20,.	$1 50
For transporting 17 bushels to market at 50 cents, ...	8 50
Interest on land and cost of transportation,.....	$10 00

In this State a fair average price for good wheat land, at average distance from great lines of

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transportation, say $60 per acre. Interest on do,	$4 20	
Average cost of transporting to market, 15 cents on 17 bushels,	2 55	
Interest on cost of land and transportation,		$6 75
The cost of making and harvesting crop and price in market are equal. Manual labor is much higher there than here, but animal labor some lower.		
Difference in favor of New-York on one acre of wheat,		$3 25

FOR CORN CROP.

Assuming 50 bushels as the average prairie crop, and 38 as the average here on good land:		
For rent of land on prairie as above,	$1 50	
For transporting 50 bushels to market at 50 cts.,	25 00	
	$26 50	
Value of crop in market at average of 80 cents,	40 00	
Net on the prairie per acre,		13 50
In New-York, rent of land as above,	$4 20	
Extra labor for hoeing, not done there,	3 00	
Transporting 38 bushels to market at 15 cents,	5 70	
	$12 90	
Value of 38 bushels in market at 80 cents,	30 40	
Net on an acre in New-York,		17 50
Difference in favor of New-York on an acre of corn giving 38 bushels, over the prairie giving 50,		$4 00

FOR OAT CROP.

Assuming 50 bushels as the average prairie crop and 40 for good land here:		
For rent of land on prairie as above,	$1 50	
Cost of transporting 50 bushels to market at 25 cents,	12 50	
	$14 00	

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Value of crop in market at average of 40 cents,	$20 00	
Net upon an acre of oats,		$6 00
On New-York farm, rent of land,	$4 20	
Transportation on 40 bushels at 7½ cents,	3 00	
	$7 20	
Value of 40 bushels in market at 40 cents,	16 00	
Net on the acre of oats in New-York,		8 80
Difference,		$2 80

The cost of making the crop, as with the wheat, is equal in both places.

The crop of barley would produce results similar to the oats. This shows an average balance in favor of New-York on these three acres of $3.86, which, added to the $4.20 above charged for interest on $60 per acre, will pay the interest on $115.

From this it is seen to be better farming on our lands costing $60 per acre, or even costing $115, than there at $20. From personal observation, it is believed that the average crop for the prairie is put as high as the average here.

But it should be remarked that these results have their application to the surpluses only which are intended for the Atlantic markets.

For the sustenance of human and animal life at home, a bushel of grain is worth as much on the prairie as here, and it follows that the means of human sustenance are much cheaper there than here, and that too whether paid for in cash or in labor. Hence, persons with small means, withwhom the sustenance of themselves and families is a primary object, have great inducements to go there.

But the foregoing statements are addressed to the man who has secured to himself the means of sustaining himself and family here, and is looking to a surplus to improve his wealth and to improve his comforts.

The extensive corn fields upon the prairies, with their heavy growth, to him will doubtless have an imposing look, but when he reflects that a thousand bushels of corn there in the granary is worth but $200 or $250, whilst here it is worth from $700 to $800; or, that a thousand bushels there is worth but three hundred bushels here, a different view is presented.

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The potatoe crop has been left out of view in this exhibit. The prairie States, from their remoteness from market, cannot successfully cultivate that crop beyond the demand for home consumption. But here, from the vastly increased demand in our markets, *that* has become one of the most important, if not *actually* the most important, as well as the most remunerating crops that we can place upon our fields. This is especially true of the eastern part of the State. It is a crop which has placed more good dwellings and out houses upon our farms, and taken more mortgages off, than any other.

There are almost innumerable lesser items which enter into the profits of the farmer here, in which, from his remoteness from market, he upon the prairie cannot participate.

The distinctive difference between farming on the prairie and farming here may be stated in few words. The farmer there has more crops and less money, whilst here he has less crops and more money.

I would therefore say to the farmer who is comfortably off here, if he is visited with a prairie fever, differing from one he may have if he goes there, that before he decides to go, to cast about him and see if he had not better set about to improve his farm here and increase his crops and increase his wealth, and still continue to enjoy the greater and lesser comforts and conveniences which he has taken so much pains to place about him, together with all the public privileges and pleasant associations which a well settled country and civilised society have also placed about him. There are very few amongst us who have not ample field for such improvement at home.

There are, however, a few instances where farm improvement has been carried so far here towards the point of perfection, that little remains to be done. But it is probably safe to say, that in those parts of our State which we call *farming country*, the annual production in crops may be increased from one-fourth to one-third, by an improved state of agriculture and farm management, before we get up to what in England and Scotland would be called "*high farming*." *

DRAINING.

As *the means of improvement*, draining, more or less thorough, according to the circumstances of each case, is one of the first

* The lamented Professor Johnston, in his lectures here, in 1849, gave a specimen of what they call *high farming*. He said their farmers would purchase cattle and fatten them, and

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steps to be taken. The crops upon thousands of acres of our fertile lands have failed in a degree the last year, being a wet one, from an excess of water. It is in vain to plow well, to hoe well, and even to manure well; our grains and roots can not be successfully cultivated upon a surplus of water. With winter wheat, no compromise can be made with water. The heavings of the frost will force an unconditional surrender.

In many parts of our State the soil, when new, was filled with fibrous substances, which kept it loose, so as readily to filter the water, and winter wheat was successfully cultivated. But as those substances have decomposed and left the soil more compact, so that the filtration of the water is obstructed, the crop is almost sure to suffer from the action of frost. Draining is the only means for bringing back such fields to wheat culture. They will then, of course, be fit for any other. So many instructions, showing the manner and the advantages of draining, are now in the hands of the reading farmer, that little more need be said upon the subject.

Next in the order of improvement, is good plowing. Experience is teaching us that in almost all instances deeper plowing is advantageous. This does not always improve the first crop, and is frequently for that cause discountenanced. This will be likely to occur wherever the subsoil is less fertile than that overlaying it. But a larger volume is turned up to be fertilized by manuring and by the atmosphere and the rains, and for the roots of the plant to act in. Another, and perhaps the greatest advantage is, the protection given to the crop from injury by heavy rains or severe drought.

We are indebted to the Hon. George Geddes, of Onondaga, for a series of experiments and the collection of authorities, by which he has shown that a cubic foot of earth when saturated, holds 7-12 its bulk in water. That when dried in the spring to a condition for plowing and receiving the seed, it holds 1-4 its bulk.

A heavy fall of rain, therefore, would often so saturate a shallow furrow, as to unfit it for the growth of the plant, when had the furrow been twice as deep, it would have furnished to the whole no more than sufficient to produce an active vegetation.

If they sold them for enough to refund the purchase money and the cost of the oil cake, hay and turnips fed to them, *and got the manure for their trouble*, they thought themselves well paid.

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Then in case of drought, when evaporation has taken out the moisture to the depth of the shallow furrow, the plant upon it withers or perishes; whilst the one standing on the deep furrow has still a storehouse below of equal or still larger amount, to be reached by its roots, or to be brought up for its use by capillary attraction. The supply in the deep furrow will be more than double, for most of the water will descend to the lower part. Besides, the force of evaporation diminishes as we descend from the surface. The deep furrow, like the sailor's woolen shirt, "is best for a rainy day, and best to keep off the sun."

MANURING.

Next in order of improvement, after draining and plowing, comes manuring. For this the farmer in the interior is to look mainly to the barn yard and the hog pen. There he finds all, or nearly all, the elements that go to constitute a fertile soil, and to constitute the plant and the crop.

Here the supply may be greatly increased, and in many cases doubled, by proper attention, and no outlay upon the farm will better pay. Very little attention has hitherto been paid to save the liquids for fertilizing. Too much importance can hardly be given to their preservation. It can be done with great economy, by the use of muck or other absorbent earthly or vegetable substances in the stable or by a basin formation in the yard. Care should be taken to carry such manures, as well as others, from the yards to the field as soon as may be, that the washing out of their fertility by the rains may be done where it is wanted.

Most of the fertilizing elements in these manures are soluble in water, and are not available to the plant until dissolved. When held in solution by the water, they are carried downward with it. This would suggest the placing of them nigh the top of the soil in which the roots of the plant are to look for nourishment.

This washing process is seen, when we place manure upon a loose sand or gravel soil, where it is all taken out by the water and carried below, in one or two years; whilst in a soil of more tenacious loam or clay, its effects are seen for more than double the time. Guano, on the other hand, is supposed to fertilize mainly from its gas, and is most effective when covered.

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To these manures should be added lime, where the soil is deficient in it, and gypsum and ashes almost any where. Then, with an occasional turning in of a clover lay, the list is sufficiently full to restore the worn out lands, and give luxuriance to all others.

When these simple improvements shall have been faithfully made, if the promised increase of one-fourth to one-third does not follow, it will be because a revolution has taken place in the laws of vegetation. And what is equally certain too, with the exception of the cost of the more thorough class of draining, the annual increase will more than pay the expense, as it progresses.

All this, to improve his condition here, should the farmer of this State do, if he is wise, before he decides to go to the prairie; and he will be much less wise if he leaves it and goes there afterwards.

STOCK.

In our animal husbandry, as we have seen, the west is in strong competition with us. When the feed to rear an animal here is worth twice as much as there, we are under the strongest inducement to improve our breeds, so that the smallest amount of feed shall produce an animal of the greatest possible value.

We have had the improved breeds of cattle with us sufficiently long to become acquainted with their different qualities, and the different purposes for which each is best suited. For this stock, in all its varieties, are we largely indebted to the enterprise and public spirit of persons whose means of doing it have been obtained elsewhere than upon the farm.

We must take care that we propagate from the breeds best suited to the object in view. For the dairy, we are to look to the milking qualities. For the yoke, for activity and strength. These qualities, with many others, are found prominent with the Devon. For beef, we are to look for form, size, early maturity and fattening qualities. These are found with the Shorthorns and with the Herefords, and their grades.

With our sheep, the improvement of stock has become much more general than with any other class of animals. Indeed, an old native from our sheep folds has become a much greater rarity among our *Spanish* Saxons than a native from the forest among our *Anglo*-Saxons.

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But whether the grain from the prairies pays the farmer for bringing it or not, it is poured in upon us in floods, and will, together with their animals, continue to come. We are this year paying a tax of one dollar and a quarter upon the thousand of our valuation, to complete the canals to help them on.

AGRICULTURAL INSTRUCTION.

To aid us in the improvement of our agriculture, and in the breeding of our stock, and also to fortify us against this pressure from the west, we require, and we must have, better means of agricultural instruction. With all the lights hitherto shed upon our agriculture, our farmers are still "walking in darkness," and will continue so to do, until instruction, both scientific and practical, shall be brought more within their reach.

Science is lending a helping hand to almost every human enterprise, and is proffering her aid to the farmer whenever the means and the accommodations can be furnished for its teachings. The best of us, as yet, know only enough of it to know our want of it. The farmer here, to a great extent, is placed upon fields which have been cultivated in the downward way, and is called upon to restore them, and wants the aid of science and well tested experiments to teach him how to do it. He wants to be taught the elements that go to constitute a fertile soil, and in what proportions they are to be united, and what will be the effect of the absence of any of them, and *how they are to be restored.* Also, how his agriculture is affected by the geological formation underlaying him, which has crumbled down and formed his soil and its basis. Also, the fertilizing elements in the atmosphere, in the falling rain and running stream, and how they may be best made to subserve his purpose.

He wants the lessons of science, so far as science has gone, in tracing and fixing the laws of meteorology; in ascertaining the difference in temperature and humidity of different localities, and in detecting the evidences of approaching storms, and of their probable duration. He wants the lessons of science to instruct him in the history and habits of the insects which invade his crops, and the best means of protoction against them.

What incalculable benefits might result from the simultaneous investigations of hundreds of intelligent men in different

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parts of the State, when aided by the lights of science, in tracing the time, place and manner of propagation, the life, habits and decay, and then the means of extermination, of the *wheat midge* that is threatening to take the bread from our mouths. In fine, he wants the aids of science in its almost infinite connection with fertilization and with vegetation.

And then he wants the aid of those practical lessons which are taught from well conceived and well executed *experiments*, made in harmony with the teachings of science; such experiments as are not likely to be made except at an institution where scientific instruction can go hand in hand with them.

We want to know with exactness what crops to put upon any given character of soil, and the best rotation of such crops, the kind of manures or fertilizers to apply to each soil, and to each crop, and in what quantity in reference to cost, production in present crop and future benefit, and then how to apply them.

We want to know, for we do not know with exactness, the comparative value on different soils in different parts of the state, of gypsum, lime, ashes and guano, or the best mode of applying them. And we want, also, to know the cost and value of these manures, compared with those from our yards and pens, and then the value of a clover crop turned in, compared with each or any of them.

We want to know the value of a bushel of corn and of a bushel of potatoes, in pounds of beef and pork, when fed to the animals, and the difference between feeding cooked or raw; the difference between feeding the corn whole or ground; and also, whether the potato should be fed by itself, or in connection with the corn. We should then know when to feed these crops upon the farm, and when to take them to market.

Many experiments have already been made in these different departments of agriculture. Very many have been made by the procurement of this society, which have shed much light upon the clouded path of the farmer; but few of them have been sufficiently repeated, and under circumstances sufficiently variant to establish facts with reliable certainty. Rain and drought, heat and cold, have so much to do with the laws of vegetation, that full reliance can not be placed upon experiments made upon cultivation, unless continued through several years, varying with seasons and with circumstances.

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There are few individuals with us who unite in themselves the science, the practical skill, the pecuniary means, the patience, the leisure, and then the inclination, to make experiments successfully, as mere amateurs; and there is no associative body or institution in the State, having the means adequate to it. This society has made beginnings, but they are only beginnings, in experimental teachings. They have done much more to bring forth and place in the volumes of their Transactions, *scientific* instruction, where the reading farmer can, with great profit, trace the connection between science and his own pursuit. The more he reads, the more, if he has intellect, will he want to read. And when he lays down his book and goes to his field, he may again read in the growing plant, the book which that science has begun to teach him how to read. He will also feel the want of more instruction for himself and for his son, who is to till his grounds after him. He will want more instruction than we can give him, and will feel, as all of us who have given thought to the subject feel, that no adequate means can be furnished to give the instruction required, except at an institution where the teachings of science and the teachings in the arts of husbandry shall be had side by side.

This society is powerless in its pecuniary means to put forth such an institution. Associated individual wealth or legislative appropriation must do it if done at all.

Many have suggested that sufficient agricultural instruction can be given in our colleges, academies and other scientific halls, by establishing there departments and professorships of agricultural chemistry. These suggestions, however, have generally come from the scientific side of the house.

Those persons, however, and those, too, of a high order of mind, who have been acquainted with the practical departments of agriculture as well as with the scientific, are, I believe, entirely united in the opinion that we need instruction from experiments in practical husbandry as much, and even more, than from the departments of science. But they also believe that such instruction should be had from the suggestions of science, and taught under its guidance.

The agricultural chemist, while in his laboratory, is dealing with elements in their purity, and knows well from experience what combinations will produce certain results. Not so when the field becomes his laboratory. He has there to deal

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with elements largely increased in variety, and more largely still increased in combination. He will often find himself at fault when he calculates certain results from certain appliances. There are so many agents operating through so many elements in the laws of vegetation, that the chemist himself cannot rely upon his science until he has carried his experiments to the field and then repeated them for many times, and under widely varying circumstances.

The farmer of this country, more than of any other, from his relation to society and to community, should be an educated man. Unlike those of the countries of Europe, he is, in the main, the owner of the soil he cultivates. If the assessment roll is to be the standard, he is the owner of more than half the wealth of this State. He should not only be educated in the science and the arts connected with his pursuit, but in all the physical sciences and in the literature of his time. He should be fitted to give successful direction to his common schools, to fill the local offices of his town and his county, and to fill a place in the State and National Legislatures. He should there be able to take an intelligent part in promoting and protecting the interests of his country, and if need be, to protect the interest of his class against the encroachment of others, whether openly or covertly made.

This does not ask too much for the men who are to represent a class creating annually sixteen hundred millions of dollars in the United States, an amount greater than is created by all besides, including the miners of California.

The present Executive, following the example of his predecessors, for several years, has, with a highly commendable spirit, called the attention of the Legislature to the subject, giving it his sanction and much strong argument; and it is gratifying to know that a law has this week passed one branch of the Legislature, making an appropriation to begin such an institution, when individual contribution shall have been made to an equal amount.

This Society has pressed the subject upon the consideration of the Legislature with all the power it possessed, for the last seven years. More than once has a law, providing for its establishment, passed one branch of that body; but from some consideration, of public policy or some other policy, it has ultimately met defeat. A reason, convenient for the unwil-

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ling, has often been given, that "the finances of the State would not justify it!"

This would have been more satisfactory to the farmer, who by direct taxation, has been paying money into the treasury by millions, if he had not seen appropriations made from that treasury, for charitable and other purposes, with unstinted hands.

Castles of the most costly order have been erected for the accommodation of the alms-asking, drawing it out by hundreds of thousands. A single one at Utica has been erected, costing more than half a million of dollars, when one of one-fourth its cost would have given suitable accommodation for all that was called for.

A single wing of this imposing structure has cost more than the farmers have ever asked, to furnish the means to educate their sons for a pursuit that gives sustenance to our race.

Our colleges, as they should be, have been liberally furnished with means to educate men for the professions, and for the higher walks of life. The mechanics of New-York, as we have seen, asked to have a prison built, to withdraw the convict from labor, that they thought interfered with them, and three-fourths of a million could be spared for that.

A million and three-quarters of dollars were required last year, to sustain the treasury, and carry forward the work on the canals, a direct tax is levied for it, of which the farmer and the farmer's son pay more than half. But when we have been asking for less than one-twentieth of this sum, to educate the farmer's sons, the answer has been, there is no money for you.

This is wrong. It is great injustice to the farmer. It is injustice to the best interests of the State. It is injustice towards that great creative agency which, more than all others, goes to enrich the commonwealth. And what should not be overlooked, it is unjust to our State pride.

We, as citizens of the State, have indulged in a pride, and a just pride, too, in speaking of ourselves, and in hearing others speak of us, as holding a high position in our resources and our endowments. We speak of the number of our ships, of our foreign and domestic commerce, of our canals and other kindred improvements; of our public charities, with their costly and imposing palaces; of our broad and richly endowed educational system; of the fertility of our soil; of the diversity of our agriculture, and the magnitude of its aggregate; of our State fairs,

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and the achievements of our agricultural societies. But at this point in our agricultural lead, we must stop. That which of all others we should have been the first to do, we have not done—*established an institution to educate the farmer.* Here we are to give precedence to Pennsylvania, Ohio, Virginia and others, who have already gone in advance of us, and established and endowed their agricultural colleges. This precedence we should not have yielded. We have no justification for it. It is not true that we could not provide the means for it. Our history shows that we could provide the means for almost every thing else. We do not deserve that rank, higher, even, than a kingdom, which has been sometimes given us, and which we sometimes give ourselves, if we could not provide the means.

But unpleasant as may be our reflections, as citizens of the State, that we have lost precedence in this enterprise, as members of this Society we have the gratification to know, that the plans matured and put forth by it and its members, have served very far as models for adoption by those other States which have taken this precedence of us in point of time.

But although we have lost the prestige which the lead would have given us, it is devoutly hoped we shall no longer delay to follow.

The newly elected President, Theodore S. Faxton, was then introduced to the Society by Mr. Cheever, and on assuming the duties of his office, remarked as follows:

GENTLEMEN OF THE N. Y. S. AGRICULTURAL SOCIETY:

It is with no ordinary feelings of emotion that I rise to thank you for your partiality and kindness in selecting me as your presiding officer for the coming year. Nor should I presume to enter upon the duties assigned me by the rules of your Society, were it not that I find myself associated with a class of men whose great experience and practical knowledge eminently fit them for the position they occupy, and on whose prompt and ready assistance, I feel I may with great confidence rely at all times, and who will, I trust, throw the mantle of charity over any short comings of mine that may occur in the course of my official duties.

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I can but promise you my best endeavors to promote the interests of this Society, so far as my ability and experience will allow; and in this I ask of you a cordial and hearty co-operation. Each and every member of this Society should feel the importance of his position, and that the success and prosperity of it depends, not on the single-handed exertions of any one individual, but the united and cordial exertions of all collectively.

Let us, then, enter upon the duties for the coming year, with the determination not to know any such word as FAIL, and strive hard to emulate the exertions of those who have gone before us in this grand enterprise. Let us bear in mind at all times, that very appropriate saying of Washington, who is called with so much truth the Father of our Country: "I know of no pursuit in which more real or important good can be rendered to our country than by the improvement of its agriculture." In my opinion, the intelligent and successful cultivation of our SOIL is the basis of all our wealth and prosperity. Nothing has been more conducive to the great interests of our State, and which gives it that pre-eminence over her sister States, to which she is so justly entitled, than the "New-York State Agricultural Society."

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REPORT ON FARMS.

The committee who were appointed on farms respectfully report: That they have attended to the duties assigned them, and all the farms entered for the premiums of the Society have been visited by one of the members of the committee, accompanied to each farm by some other member of the committee.

The committee have endeavored, in their personal examinations, to ascertain as fully as practicable the manner in which the operations of the farm were conducted; to ascertain what relation the owner of the farm bore to its present appearance; whether it had been reclaimed by his energy and skill from a barren or worn out condition to a state of fertility; whether wet and swampy lands, useless, or nearly so, had been restored by thorough drainage and careful tillage and rotation of crops; whether improved lands had been still further improved, and rendered more productive by the skill and well directed efforts of the occupant, or whether the farm, rich by nature in all that could contribute to the successful rearing of crops, had been, without particular attention to its culture, suffered to return the bounteous products which its natural fertility rendered almost sure.

In connexion with these inquiries, it was deemed of importance to ascertain the economy with which the farm was managed in its every department; the manner of securing, increasing and multiplying fertilizers, as well as their judicious application, the extermination of injurious weeds, the construction of fences, buildings and out-houses, the removal of stones or other obstacles which might hinder the profitable culture of the farm, and whether, as improvements progressed, a diminution of expenses in raising crops was secured.

The farms were visited in the latter part of June and the first two weeks in July, when an opportunity was afforded of examining carefully the grass and growing crops, and when the fields would give unmistakable evidence of the manner in which the operations had been carried on.

The farms examined were located in Putnam, Washington, Seneca, Tompkins, Wayne and Livingston counties; the first two in grazing and dairy districts, the remaining four in the fine grain growing districts of western New-York. The committee feel it important in making up their awards, that a

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separation between the grazing and dairy and the grain farms should be made, and as the Executive committee approved of their suggestion, premiums will be recommended in accordance with the above decision.

In examining these farms, the committee are gratified in being able to speak very favorably of the general management of the farms examined, and they believe that there has never been presented, for the premiums of the Society, farms in a higher state of successful culture than some which have been examined. The farms from which reports were received, and to which premiums have been recommended, possessed in a very high degree striking evidences of minute attention to the improvements of the present day, and far in advance of the general system of culture of but a few years since. They showed that the owners and occupiers of these farms had studied carefully as to the means best adapted to increase the fertility of their lands, to diminish the expenses of their culture, to improve their farm buildings, to secure choice fruits, and to add to the general appearance of the farm, as well as to increase its products. The stock best adapted to their purpose was reared.

The committee will give brief extracts from the reports of the visiting committee to the separate farms, before announcing the awards, together with some suggestions as to a uniform system of keeping the accounts of the farm. The reports of the applicants vary very materially as to the charges for the same services; they also adopt a different basis, upon which the profits of the year are determined. In some instances the farm is put in the account at its fair cash value, and interest is charged upon that, while in others no charge is made; taxes also are charged in some instances, and in others omitted. The committee, in making up their award, have stated an account upon as nearly the same basis as practicable, which enabled them much more satisfactorily to arive at the results which they have to submit.

John V. Grove's farm, Ovid, Seneca county.

This farm now contains about two hundred and five acres in one body, and a wood lot a short distance from it of twenty-four acres.

The history of Mr. Grove's connexion with it is as follows: He came to live on a part of the farm twenty years since, in

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the spring of 1835—then containing 116 acres—which he rented at $2.50 per acre from the executors of his wife's father, (she as her share owning twelve acres.) The farm was then considered a poor worn out farm covered with noxious weeds and very insufficiently fenced, and a log cabin and barn of moderate size. He rented for a few years, and then became the purchaser—and at this time by his judicious management, it has been brought to a state of great fertility, the weeds are almost without exception eradicated, and it is now in its every department a most desirable farm, yielding regularly remunerative returns to the owner.

The farm was stony when Mr. Grove took it. The stones have been removed and placed in drains, by which all the surplus water is carried off—the weeds by a course of thorough tillage with hoed crops have been subdued, and the fences are in a condition that could scarcely be improved.

The amount of tillable land is 155 acres, and his farm is divided into twenty lots, varying from three to twenty-two acres. The fences are made of rails, the logs sawed to an equal length, giving an uniform fence with caps and stakes, the caps below the second rail from the top, thus allowing the fence to settle without disarranging it. To each lot a painted gate is attached having on it the whole area of the lot, and the area that is tillable, and a neat engraved map at the house shows the divisions of the farm.

There are lanes leading from the barn-yard and out buildings to the different lots, and not a noxious weed was found in these lanes, but clean grass was growing, as in the fields.

Every field under culture was examined, and the crops were excellent—thirty-two and a half acres of wheat were being harvested, and promised a large yield, should it escape the effects of the severe rains which had sprouted it to some extent.

Forty-five acres of corn planted on sod land, appeared very well. We found uniformly in all the fields of corn, the outside rows as good as any part of the fields, and the poorest portion of the lands naturally, with as stout corn as the best. This Mr. Grove secures by a careful course of special manuring of the poor places in his fields, so that all may be brought as near as possible to an equal yield, adding largely to his profits and giving a most acceptable uniformity to the eye of the beholder.

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Mr. Grove seeds after wheat—bushel of clover to five acres, and occasionally adds timothy. He raises clover for seed with considerable profit. We examined one field that had yielded eighteen hoed or grain crops in twenty years—hay two years; being in grass when we saw it, from which the crop had been cut, averaging two tons per acre. Mr. G. has, in order to cleanse his land thoroughly, as well as to provide for its payment, driven his land with grain crops a portion of the time more severely than he now practices. His grain is drilled in—his experience, he says, gives this a decided advantage over broadcast sowing.

The effects of thorough systematic drainage is most obvious, and the pecuniary gain is very large indeed. Wherever a spot is found that indicates too much water, it is remedied by a side ditch to a main drain.

Some large pieces of lime rock in one of the fields, covering half an acre of land, had been buried out of reach of the plow, and a crop of hay this year from the field gave two tons per acre. These are but specimens of the thorough manner in which Mr. Grove has performed his work.

We were favorably impressed with the neatness of every part. The grass growing in the corners of the fence of every cultivated field was regularly mowed, and was of an average quantity with the grass fields—an advantage that few farmers we presume take pains to secure.

As to Mr. Grove's method of farming, reference is made to his report. Taking into account the condition of this farm when taken by Mr. Grove, and his circumstances, and the high state to which he has brought it, he is certainly entitled to the highest credit. The farm as it now is, owes all to his skilful management and his untiring energy. The smallness of the fields upon this farm, imposes a very serious outlay for fencing and deprives Mr. Grove of considerable land which should be under cultivation.

John Westfall's farm, Lyons, 200 acres.

This farm was found in very fair condition. For many years it was devoted to wheat growing, with very great profit, lying in a rich wheat district; but the ravages of the wheat midge has induced a change of crops. This farm is naturally satu-

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rated with springs, and seventeen years ago Mr. Westfall's father commenced a system of drainage which is still continued, and the farm has been very materially benefited, and fields are now in fine condition for any kind of crops that formerly yielded but indifferent crops from excess of water.

The crops growing were wheat, corn, oats, barley, potatoes, and grass—all good. The wheat had been harvested, the land cleanly cultivated, and some of the crops were very heavy. On the meadow lands, lying on the creek which passes through the farm, there were some thistles, which, though difficult to eradicate, should be overpowered.

Mr. Westfall's dwelling and outbuildings were peculiarly neat and convenient, showing that the farmer's habitation may be as tasty and convenient as that of any class of our citizens, and still be appropriate to his calling. The grounds around were tastefully arranged with shrubbery—the garden in capital condition—his fruit of the different varieties of the choicest kind. His barns, sheds, and stables were extensive, with a place for everything, and everything in its place. His statement is so full as to the manner of managing the farm, that further comments are unnecessary.

James Mc Lallen's farm, Trumansburgh, Tompkins county, contains 160 *acres.*

Mr. Mc Lallen was brought up to the mercantile business, in which he is still engaged. His health failing, he turned his attention to farming in 1848, with great benefit to his health, as well as to his farm.

His farm was in a very low condition when he took it, much of it very wet, rough, and forbidding, giving but scanty crops.

He commenced a regular account with every field in his farm. All the operations on the farm are contained in it from the beginning, thus enabling him to notice from time to time the progress which he has made, and where he can best alter his course of farming. He has also a meteorological journal from 1850 to 1856, which has been of very great advantage, and is recommended for adoption to every farmer. A certain condition of the weather has been noted for a series of years, and now when it is indicated by the barometer, Mr. Mc Lallen is prepared with reasonable certainty to guard against its injurious effects.

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The great means of improvement which have been adopted are thorough drainage and ditching, and thorough plowing and manuring. All the drains and ditches upon the farm are mapped out upon the farm book, with the depth, and size of tile in each; and thus at a glance, when there is a defect anywhere, he can remedy it. Subsoiling has also been practiced with manifest advantage. We examined a field of corn on a clay soil marsh, with some black muck, sand and gravel, which had been drained and subsoiled, and the crop was one of the best that had come under our notice.

We were enabled to see clearly the advantage which Mr. Mc Lallen had secured by his thorough system of drainage, by a comparison with the lands adjoining, which equally require it, but which had been neglected.

Mr. McL. for the last few years has cultivated the Mediterranean wheat, on account of the wheat midge, and his crops have usually been very good.

Root crops have received considerable attention on the farm, and with very favorable results, and it is believed that more attention to the cultivation of roots would prove advantageous to most of our farms.

Mr. Mc Lallen is giving considerable attention to stock, and has a thorough bred short-horn bull, which is doing him good service.

His report is full as to the manner of his farming, and shows, we think, very commendable progress.

Charles Jones's farm, Moscow, Livingston co., 400 acres.

This farm is situated on the west bank of the Genesee river, about two miles east of the village of Moscow. Improved about 370 acres; nearly level and presents a remarkably smooth and even surface. Soil an alluvial deposit composed of muck and sand, the former predominating.

Grain proved to be the principal object of the owner. Two hundred acres were covered with wheat (blue-stem variety), of a remarkably large and uniform growth, nearly ready for the harvest, and which from its appearance indicated an average yield of from 25 to 30 bushels per acre. The crops did not appear to be much injured by the "wheat midge," though somewhat injured by the "Hessian fly." Most of the wheat was

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stubbled in, that being the mode usually adopted. The same quality of land had produced last year from 25 to 30 bushels per acre.

Ninety-five acres were planted to corn, round white flint; exceedingly uniform in size and of large and forward growth. A portion had been treated with barn yard manure, and with good effect. The crop of the preceding year, 60 bushels per acre, upon similar land.

There were no summer crops except a few acres of oats, which were very heavy. About 25 acres in meadow; clover and timothy, which would cut two tons per acre. The residue in pasture.

The system of rotation was to break up a clover lay of two or three years, manure from the barn yard, plant corn, follow with barley or wheat, and afterwards with wheat and seed with clover, this to remain two or three years in meadow or pasture as the necessities of the owner required, generally plow eight inches, occasionally somewhat deeper.

All the manure used on the corn crops; no special manure except gypsum to clover pasture, without any special benefit.

Forty head of cattle are kept on the farm during the summer, and a larger number in winter, which are kept chiefly on straw and corn stalks uncut, no hay being fed till spring. Mr. J. is now making preparations for feeding cattle for market, to which branch of husbandry he intends to devote more attention hereafter.

No sheep are kept; no more swine than are necessary for home consumption, and a sufficient number of horses to perform the labors of the farm.

The farm is divided into fields of 30 or 40 acres each, and the fences made of posts and boards are in excellect condition.

The farm is watered by the Genesee river, which bounds nearly two sides of it, and water for stock at the barns is brought in an artificial conduit, from the canal about a mile distant.

The appearance of the fields and crops was such as indicated thorough tillage.

The bye lanes were filled with noxious weeds, showing that too little attention had been given to their eradication.

The farm buildings were not deserving commendation. The dwelling house a hybrid of log and frame, standing only a few feet from the street, rendered the aspect highly unpleasant. In

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the rear are two barns and sheds of limited capacity for the size of the farm, without basements or other modern fixtures and improvements alike essential to comfort, convenience and good taste.

The committee in their personal examination of this farm saw much to admire in the way of natural advantages, its desirable location, its smooth and unbroken surface, its rich and fertile soils, and the luxurious growth of all kinds of farm produce, yet they venture the opinion that these qualities are the results of natural causes and should not therefore be ascribed to a very high degree of human skill and ingenuity.

(The report from Mr. Jones not having been furnished, Mr. J. being delayed it is understood from reaching the city until the committee had completed their report, the same was not submitted to them.)

William. M. Holmes' Farm of Greenwich, Washington county, 184 *acres.*

It was visited in June. It has a variety in soil, varying from sandy to occasional ledges of rock, and from good dry gravelly corn land to a somewhat tenacious loam, with clay subsoil, and the crops were advantageously adapted to their several varieties of soil. From the farm, and leading to the rear lots, there is a well fenced lane, and the arrangement of fields appears judicious. The farm is in excellent fence, mainly of chestnut rails, with a little stone wall; the farm buildings are spacious and convenient, and all the farm operations appeared to be carried on with good taste and economy.

Two features in Mr. Holmes' management attracted the particular attention of the committee, first, besides four or five hundred rods of open drain, he has laid some six hundred rods of covered drain, in land, some of which would, by some pretty successful farmers, be considered quite passable without such an expense, but the fine crops of grain and grass, growing luxuriantly in this very wet season on these well drained fields, justified all Mr. Holmes' outlay for tiles and labor, and showed that it was true economy.

Second, Mr. Holmes has also adopted a new practice in stocking down with grass seed. It is a common practice to sow grass seed in the early spring, both on fall and spring grain. With the spring crop he sows no grass seed. Soon after

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harvest, in August, he turns over the stubble neatly with a shallow furrow, and about 1st of September seeds with half a bushel of timothy to the acre, giving it a slight harrowing.

We saw side by side seeded in both ways last year, and the advantage was altogether in favor of the September seeding, the crop being, as we judge, a quarter heavier, and perfectly free from weeds. We learn that the actual yield was twenty-five per cent in favor of the September seeding.

We are satisfied that fall seeding is the true plan for this section of the State, and it certainly is worthy of trial elsewhere.

Mr. Holmes' report will be found full as to the details of his farm management.

L. D. Clift's Farm, Carmel, Putnam county, 160 *acres.*

Mr. Clift has occupied this farm for forty years; soil darkish black loam, subsoil yellow color, principally gravel and sand. It is of an uneven and rolling character, and was originally nearly covered with stones and bolders. Almost the whole farm has been dug over, and the stones removed and placed in solid walls or in drains. The farm is now in fine condition, fit for the plow at six to eight inches deep, without disturbing any stones, and is very clear of weeds. A vast amount of labor has been expended upon it to bring it into its present condition.

Mr. Clift has improved it by draining, irrigation and liberal manuring when needed, after the stones were disposed of.

About thirty acres of the farm are irrigated from a stream running through the farm, which is dammed so as to give the required head of water, which is distributed each side of the stream, and is conducted in main ditches, from which the water is distributed over the surface of the land, and removed after being on sufficient time to receive the desired results.—See Trans., 1854, Putnam Co., p. 582.

The increased fertility of the land is most apparent, and the crops were very materially benefited. The drains above the dam enter the pond, and contribute to the supply of water. We examined one meadow, which we were assured had been laid down for thirty years (June grass and white clover), which

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was in fair condition; it had received manure occasionally. The grain crops are now oats, rye, corn and occasionally wheat. Rye has, from the prevalence of the wheat midge, taken the place of wheat. The crops growing looked promising, and were well cultivated. One hundred acres of the farm is suited for mowing, and the balance, sixty acres, can be used for grain and pasture.

Mr. Clift mows and feeds the grasses. Cattle supply the place of field crops to a considerable extent. Buys in February and March, so as to feed as little as possible before grass.

Mr. Clift uses a preparation of lime and salt, the lime the largest quantity, on his hay, as it is placed in the mow, the composition being in the state of powder. He has continued this practice for five years, and since its use his cattle have never been sick, and he considers it a sure preventive of the heaves.

A muck bed on the farm has been used with great advantage on crops and meadows.

The stone walls upon the farm required immense labor—the small stones were laid in the bottom. Some of these walls are six feet on the bottom and six and a half feet high, and two feet wide on top. These were made so as to dispose of the surplus stone.

Blind ditches, not less than three feet deep. Flat and cobble stone are used to make the drains, and being carefully laid, they operate well. Almost the entire farm is drained. Some of the hill land it was thought might be improved by tile drainage.

Mr. Clift's buildings, especially his barns and sheds are convenient and will accommodate the farm very well.

Mr. Clift formerly devoted his farm to mutton sheep with profit. The milk dairy business has also been successfully pursued for a time; and he is now devoting his farm mainly to prepare cattle for market, which will pay well.

We were much gratified in the examination of the farm. The amount of labor bestowed upon it has been immense, and it redounds greatly to the credit of Mr. Clift, that he has been able by industry and good farming, to reclaim this very rugged land, and to present it as he now does in such fine condition for the plow, the reaper and the mower—which when he took it, was not suited to either of these implements. It was when he commenced upon it worth about $35 per acre—and it would at this time for farm purposes, command we are assured, $100 per acre.

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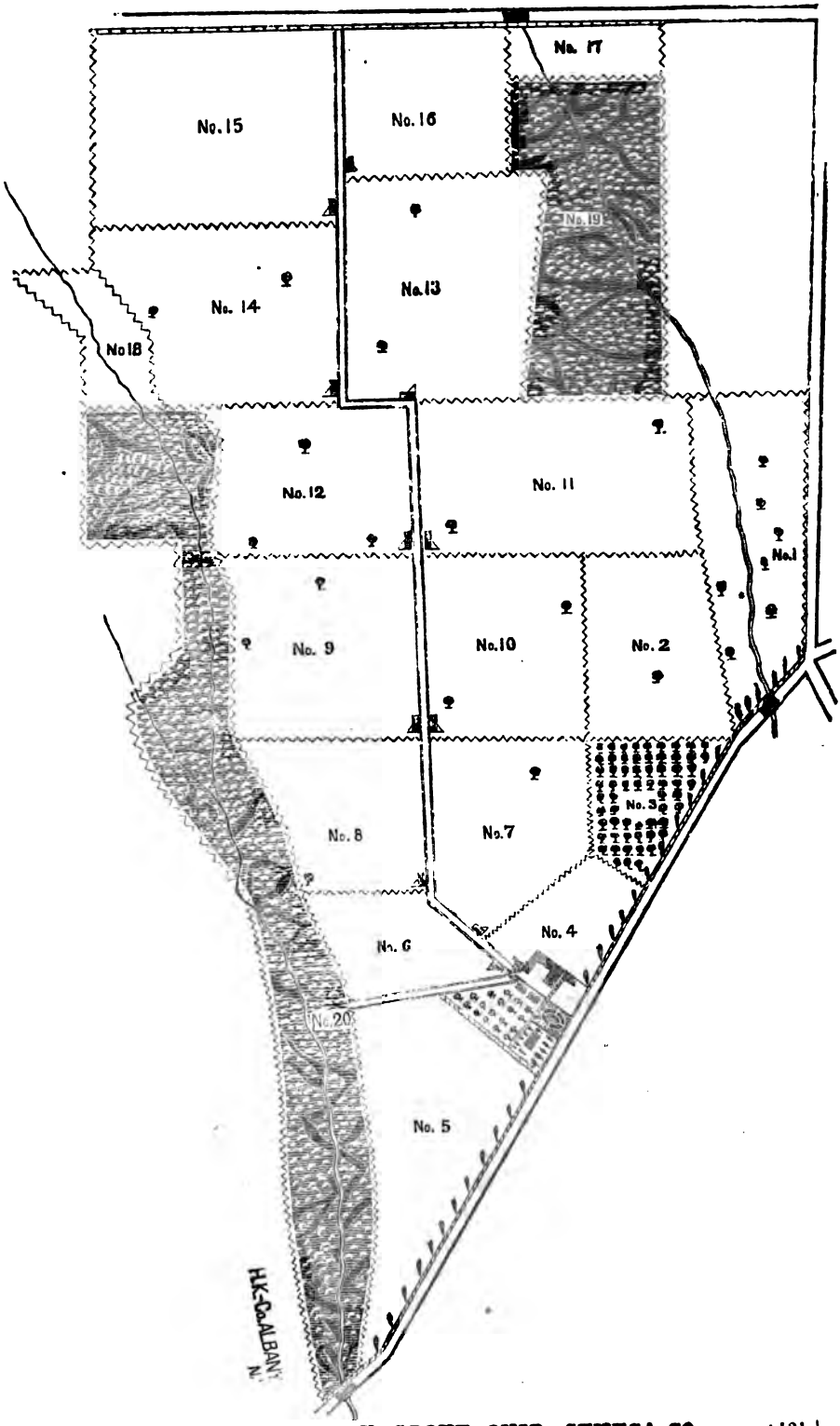

FARM OF JOHN V. GROVE, OVID, SENECA CO. [131.]

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Mr. Clift's statement will give in detail the method pursued more particularly than we have given.

The committee after a careful examination of the statements of the competitors, recommend the awards as follows:

GRAIN FARMS.

1. John V. Grove, Ovid, Seneca county, plate valued $50 00
2. John Westfall, Lyons, Wayne county, do 30 00
3. James McLellan, Trumansburgh, Tompkins co., do 20 00

DAIRY AND GRAZING FARMS.

1. Wm. M. Holmes, Greenwich, Washington co., do $30 00
2. Leonard D. Clift, Carmel, Putnam county, do 20 00

In making the above awards the committee have endeavored to keep in view the principles referred to in the commencement of their report, viz. the relation which the owner of the farm bore to its present appearance and condition—so that the farmer should be rewarded for the skill and energy with which the farm has been managed under his directions—they believe that a perusal of the reports of the visiting committee, as well as the reports of the competitors, will justify the awards which have been made.

WILLIAM KELLY, JOHN MCDONALD,
D. W. C. VAN SLYCK, CHARLES MORRELL,
B. P. JOHNSON. *Committee.*

John V. Grove's farm, Ovid, Seneca co.

This farm lies in the town of Ovid, Seneca co., and consists of 234 acres, of which 37.54-100 are wood land, and about three acres in highways; no waste land.

The soil is mostly limestone, some clay, with little sand and gravel; the subsoil of the clay lands is a dark hard pan, and the limestone has the same subsoil; rocks, limestone and bolders.

The mode of improving this farm, is a clover lay of two or three years, turned under about the first of May for corn, and in August for wheat, applying manure to corn.

Plow from four to six inches for corn, and from eight to ten inches for wheat. The effect of deep plowing for wheat has been good on all the soils of the farm; on the clay soil for corn decidedly injurious. No special experiments have been made to test the difference with a succeeding crop, between shallow and deep plowing.

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The double plow has been used for wheat with decided advantage. The subsoil plow has not been used. The farm has been thoroughly drained, and with most satisfactory results. The trees on the farm were the red and white oak, sugar and soft maple, bass wood, red and white beach, hickory, whitewood, wild cherry and butternut. The plants indigenous to the farm, so far as can be ascertained, were ginseng, adder's tongue, blood root, wild turnip, mandrakes, blackberry, crow foot, &c.

Manures.—In the application of manures, from ten to thirty loads per acre according to the condition of the soil. The manure is drawn from the yard, and applied in its green state to land intended for corn, dropped in heap, and spread immediately before plowing. The manure is not kept under cover, though it is believed that it would be a decided advantage to do so.

The manures made from the crops grown upon the farm—hay, straw, and stalks, which are all used up. From twenty to thirty head of cattle are usually fed, which produces a large quantity and excellent quality of manure, and usually apply to the farm about three hundred loads yearly. Manure is applied to corn, and in its green state, which is considered the most beneficial. There is no means within my reach to essentially increase my manure with advantage.

Lime, plaster, and guano have been used; plaster is used on clover, and in the hill upon corn with decided benefit. Lime and guano have been used upon wheat, but without perceptible advantage.

Tillage Crops.—One hundred and three acres have been under tillage the present year—thirty-two and a half acres in wheat, ten and a half in barley, fourteen in oats, one in potatoes, and forty-five in corn.

One and a half bushel of wheat per acre for seed. The wheat grown on clover lay, barley and oat stubble—sown from the first to tenth of September, put in with drill, and harrow lightly. The wheat midge has injured the wheat crop for four years past, but no remedy has been discovered. No experiments have been made in relation to the quantity of fertilizing matter taken from the soil by an acre of wheat. Harvest with grain reaper about the tenth of July. An average yield of about twenty bushels per acre. Seed with clover and timothy about the middle of April.

Winter Barley—Sown on clover lay, two and a half bushels seed per acre, about the middle of September, with a drill,

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and harvest with reaper about the first of July Yield thirty-four bushels per acre.

Oats.—Two bushels per acre sown with drill on corn stubble as early as possible. Yield, sixty bushels per acre.

Corn.—Plant from five to six quarts per acre, from the fifth of May to first of June; cultivate as follows: Plow from five to six inches, harrow until the soil is well pulverised, plant in hills three and a half feet north and south, and four feet east and west; plaster as soon as the plant appears, and pass through with a one-horse cultivator both ways; after that plow each way, turning to the hill; usually finish about the tenth of July; cut up the last of September. Product usually fifty bushels per acre. Yield this year on forty-five acres—4,441 bushels of ears.

Potatoes.—One potato of medium size, uncut, in a hill; plant as early as possible, and harvest as soon as ripe. Yield this year, 300 bushels per acre. As manure is applied for corn, and the land plowed from four to six inches deep, the manure is covered to about that depth. As manure is not applied on the surface, the difference between that and the usual mode adopted on the farm cannot be given. The disease has affected potatoes, but no specific remedy is known. The practice has been most successful in planting as early as possible, and digging the potatoes as soon as ripe.

Grass Lands.—Timothy and clover are the varieties used; four quarts of timothy and twelve pounds of clover mixed per acre, sowed about the middle of April by hand. As the dairy business has not been pursued on the farm, cannot judge as to the grasses best adapted for dairy purposes. Twenty-two acres are mowed, yielding on an average about a ton and a half per acre; the grass is cut when most of the clover heads begin to turn brown. The usual practice of curing is, to cut with a machine in the forenoon, rake and cock in the afternoon and let it stand until cured; usually open before drawing in.

There is none of the cleared land on the farm unsuited for plowing. Irrigation has not been practiced, and there is no low lands to be reclaimed. Weeds have been eradicated almost entirely by planting with corn three years in succession and hoeing thoroughly. The most troublesome have been pigeon weed or red root (*Lithospermum arvense*, Linn.,) and the Canada thistle.

Domestic animals.—Usually keep four cows for the use of the farm. No stock is raised; but for the purpose of pastur-

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age and to consume winter feed and for stall feeding, stock is purchased. At present on hand five milch cows, thirty-two head of young stock and dry cows—mostly from two and a half to three and a half years old—of these, twelve are in the feeding stalls. Have on the farm five work horses and six colts. The cattle are of the ordinary breed. Most of the horses are of the "May-day stock," well and favorably known in this county. No experiments have been made to test the relative value of different breeds of cattle. Cattle are housed nights and during storms; in fine weather have the liberty of the yard, and are fed on corn stalks and straw, are watered from a well in the yard. Hay is fed in the spring. This is believed to be the cheapest method of wintering stock.

No cheese is made; butter mainly for family use, and no account is kept of the number of pounds, except when butter is sold.

Do not keep *sheep*—but when a surplus of feed is on hand, purchase sheep and sell previous to shearing for the eastern markets. No experiments have been made with sheep, except as they have been fed for market.

Swine.—Usually winter six. Feed them as store hogs until corn is ready to husk, and then give them poor corn; killing at a year or a year and a half old, and pack for family use; usual weight two hundred and fifty to three hundred pounds. No experiments have been made as to the relative value of potatoes, turnips, &c., as compared with grain for fattening purposes.

Fruit.—Have forty-nine apple trees, grafted with the Russet, Northern Spy, Tompkins King, Spitzenbergh, Belle Flower, Romanite, Fall Pippin, &c., most approved varieties. Peaches: Early York, Imperial, Rare Ripe, &c. Plums: Bolmar, Washington, Green Gage, Egg, &c. Pears: Vergalieu, Bartlett, &c. Cherries: Albany, May Duke, Black and White Tartarian, &c.

Insects.—The catterpillars—kill them in the early part of the season. Plum trees have been infected with black knots; cut them off as soon as they appear. The best remedy is to keep the trees well manured and thrifty. The growing, thrifty trees are the least affected with these excrescences. I cultivate the land with hoed crops, while the trees are young, and when they attain a suitable size, seed down for a short time. Usually prune in the spring with saw and knife.

Experiments.—Have tried a number, but without any very interesting results, excepting that in my field No. 11, which I

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had run very hard in raising wheat, until it had become very foul with Pigeon weed and Canada thistles. In the spring of 1853-4 I planted to corn each year and tended it well, and about the middle of August went through the corn with a hoe and cut all the thistles that could be found, which completely subdued them, so that in 1855 the same field was sowed with oats, and no thistles were to be found. My field No. 10 has been cultivated twenty-one years; have raised seventeen crops of grain of different kinds; pastured it two seasons; have mowed it two years, and raised a crop of clover each year. All the manure that has been applied is the corn stalks that grew upon it, one year was fed on the land. This field is limestone soil, and on a portion of it the limestone rock comes so close to the surface that it cannot be plowed to exceed three inches deep. It is apparently now in good condition, and will produce as good crops per acre as any land in the county.

Buildings and Fences.—House of wood 25x27, 17 feet posts, wing 18x26, and a kitchen and wash room 16x32; wood house 16x20, and other out buildings, all finished and painted white, and put up in a good substantial manner. Farm buildings nine in number; carriage house, painted, 28x32, and leanto 12x32. Two barns, one 28x56, 14 feet posts, the other 24x42, 14 feet posts, and granary 10x16; shed 18x40, and cattle stable 14x50; barrack 16x16; stable 16x56; hog house 16x29; corn house 14x18, and hen house, all so arranged that the manure from all of these buildings is thrown into one yard.

Fences.—The farm fences are made of rails, staked and capped, costing about seventy-five cents per rod. Fence about barn yard—board fence planed and painted red; cost one dollar per rod. Garden and door yard fence built of pickets painted white, cost three dollars per rod. No wire fence has been built.

Products.—Grain sold is all weighed with scales, that used in the family or for feed is measured. That sold is registered when delivered, and that used in family is registered when taken for use.

Accounts.—Regular farm accounts are kept, so that the annual expenses of the farm, and the income from it, can be given, so that at the end of the year a balance of Dr. and Cr. is given. This practice conduces very much to careful farming and economy in all the operations, and much pecuniary benefit has resulted from it.

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Receipts and Expenditures.—The annual receipts and expenditures of the farm are annexed. The garden products, poultry, fruit, butter, milk and wood used in the family are not credited to the farm, nor the pasturing of my teams or cows used on the farm.

Marketing.—The expense of marketing the products of the farm does not exceed three per cent, as the place of delivery is within two miles.

The questions submitted have been answered to the best of my ability. January 1, 1856.

FARM EXPENSES FOR 1855.	*Dr.*
Paid out for labor,	$526 15
blacksmith's bill,	35 00
shoe bill,	26 90
county and school taxes,	62 25
store bill,	361 16
tailor's bill,	14 00
bill for thrashing,	59 50
sawmill bill for sawing,	23 36
for ready made clothing,	15 50
for stock bought to feed my surplus grass and fodder,	1,927 00
Interest on the 234½ acres of land as estimated at $100 per acre for one year,	1,641 50
My own services for one year,	300 00
son Marion's services, 3 months out of school,	40 00
son Scott's services, 3 months out of school,	40 00
wife's services for one year,	100 00
daughter Mary's services,	100 00
For grain fed, two horse teams and one single horse	125 00
Insurance paid for year,	8 00
For 48 bushels wheat for seed, at $2 00 per bush.,	96 00
26 " barley " 1 00 "	26 00
29 " oats " 50 "	14 50
10 " corn " 1 00 "	10 00
3 " clover seed, 8 00 "	24 00
1½ " timothy seed, 3 00 "	4 50
Expenses for labor of getting out clover seed, &c., to 10th February,	52 75
	$5,633 07

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RECEIPTS OF FARM FOR 1855.		Cr.
From field No. 12, 10.43-100 acres, 344 bush. barley, at 9s. 6d. per bush.,		$408 50
From field No. 11, 14.9-10 acres, 669 bush. oats, at 40c. per bush.,		267 60
From three small pieces potatoes, 300 bush., at 31c. per bush.,		93 00
Thirty-two tons of hay at $6 per ton,		192 00
	Bushels.	
From field No. 1, 9 acres planted with corn,	834	
" 3, 4.50-100 acres corn,	463	
" 4, 3.7-100 "	284	
" 7, 8.43-100 "	938	
" 8, 6.32-100 "	694	
" 13, 13.89-100 "	1,228	
	4,441	
4,441 bushels corn, at 42½c. per bushel,		1,887 42
From field No. 2, 8.7-100 acres in wheat,		
" 15, 16 "		
" 16, 8.24-100 "		
Is 480 bushels of wheat,		840 00
" 10, 9.76-100 acres clover seed,		
" 14, 12.24-100 "		
The above two fields were mowed for hay and gave 44 bush. clover seed, second crop,		308 00
Sold 232½ lbs. butter, at 18c. per lb.,		41 85
poultry,		24 95
5 hogs—1,250 lbs. pork, at 8c. per lb.,		100 00
Received for pasturing,		17 75
from sales of stock,		2,571 82
		$6,752 89
		5,633 07
Net profits for the year,		$1,119 82

After charging the following:		
Interest on farm,	$1,641 50	
Taxes,	62 25	
Store bill,	361 16	
Tailor bill and clothing,	29 50	
For services of self and family,	580 00	
	$2,674 41	

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This farm as originally occupied in 1835, was estimated as worth a trifle less than $30 per acre. A statement of its condition will be found in the report of the committee, ante p. 122. It is now, 1855, worth $100 per acre; under good improvement, with convenient buildings and out buildings; thoroughly drained, cleaned of all foul weeds, except a few thistles on a piece lately purchased; the stone cleared off, so that a mower or reaper can be used in any of the cleared fields, that have been laid down and cultivated.

The method of farming has not been according to common usage, nor such as I would recommend under favorable circumstances. The farm at the commencement was a rented one, and it was from necessity, run so as to secure the largest possible returns; and since purchased, the same crop (corn) was planted years in succession to *destroy the foul weeds*, that were so troublesome.

Stock has been fed not for speculation, but the farm being a grain growing one, stock has been purchased, in preference to raising it, so that the corn stalks, &c., could be fed and returned to the farm in manure for the benefit of the crops raised.

Statement of farm, &c., at this time:

234½ acres of land at $100,	$23,450 00
Stock on hand,	2,080 00
Money and bills receivable,	1,296 54
Farming utensils used on farm,	545 00
All grain on hand, except wheat and clover seed,	2,063 31
Wheat, $840, Clover seed, $308,	1,148 00
	$30,582 85

JOHN V. GROVE.

J. Westfall's Farm, Lyons, Wayne county.

1. *Soils, &c.*—My farm contains 202 acres, situate on the west bank of the Canandaigua outlet, two and a half miles from the village of Lyons, Wayne county. The quantity of improved land is 165 acres, twelve acres of highway, and the remaining twenty-five acres wood land. I have no waste land.

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2. The nature of the soil is various, about one-fourth is a sandy loam, the remainder a clay loam; the subsoil is a strong clay loam. Most of the land contains limestone in greater or less quantities. The rocks are granite and limestone.

3. The soil varies in the same field. I make the same application to, and use of the different kinds of soil in the same enclosure. I consider the best mode of improving my soil turning under a two or three years lay of clover in the spring, and applying barn yard manure, at the rate of forty loads per acre, plowed under.

4. I plow from seven to nine inches deep; deep plowing loosens the soil, and allows the roots of plants to penetrate it, endures wet weather and drouth better than shallow plowing, and lessens the labor of subsequent culture.

5. I have made no very accurate experiments to test the difference between deep and shallow plowing in a succeeding crop, but my general observation has been, that a succeeding crop is greatly benefited by deep plowing.

6. I have used the subsoil plow; its effects were, that the first crop was very light, owing probably to turning up too much of the subsoil, and also to the drouth; the second crop was abundant and satisfactory. I have drained a large portion of my farm, using stone chiefly, and they answer a good purpose; sandy and clay loams, having a stiff clay subsoil, have been greatly benefited thereby. I have reclaimed several acres of wet land in this way, which was previously unproductive, making it dry and fertile.

7. The timber indigenous to my soil is hard maple, white and red beach, hickory, basswood, whitewood, white and red elm, white and black ash, butternut, with here and there a white oak and a wild cherry. The plants are mullein, bur dock, mandrake, bull and Canada thistles, narrow and broad-leaf dock, milk weed, poke, tory weed, catnip, mayweed and others.

8. *Manures.*—I apply from thirty to forty loads of manure per acre, according to its quality. I draw out such portion of my barn yard manure as is uncovered in the spring, and apply to corn grounds, placing in heaps about twelve feet apart each way, spreading only as fast as plowed under. A portion is made and kept under cover, as I have plenty of barn, cellar and shed room; this, when rotted, is spread on fallow and barley stubble, previous to last plowing for wheat.

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9. My manure is made from the straw of twenty-seven acres of wheat, twenty of barley, eight of oats, the stalks of twenty acres of corn, eighteen acres of hay, clover and timothy, all fed to my stock, seventy head in all. My stock are kept in stable and yards, and fed regularly. I do not depend on straw for fodder, but use it freely for bedding, the cattle eating a portion of it. I make 450 loads of manure annually, all of which is applied to my farm during the year.

10. My manure is generally applied in a green state; I prefer using it chiefly for corn crops, though rotted manure is highly beneficial as a top dressing to wheat or meadows. I have seen good effects from its application to wheat in the fall, preventing the roots from being thrown out and destroyed by frost.

11. I think I could increase my supply of manure essentially by a little extra labor, by hauling mud and muck removed from ditches.

12. I have used no special manures except gypsum, which I apply to clover, and also on wheat when seeded with clover. I use about one bushel to the acre, sown broadcast in the spring; the results are highly beneficial.

13. *Tillage.*—I till 165 acres: wheat, thirty acres; corn, twenty-four acres; barley, twenty-five acres; oats, ten acres; potatoes, four acres; buckwheat, seven acres; meadow, nineteen acres; turnips, half an acre; orchard and garden, twelve acres; pasture, about thirty-three acres.

14. The amount of seed, time of sowing, &c., is as follows: I break up a three years lay of clover in spring with double plow, depth eight inches, turning under fresh barn yard manure, then harrow till the surface is perfectly mellow, usually three harrowings, then mark out the ground with corn marker three feet eight inches apart each way, plant four to six grains of corn in a hill about the 10th of May. As soon as the blade makes its appearance I stick pumpion seeds in every second hill of each alternate row, and apply a handful of wood ashes to each hill; if my ashes fall short I apply a small tablespoonful of gypsum instead. I commence cultivating as soon as the rows can be distinguished, with a one horse cultivator, both ways, then dress with the hoe, and continue to cultivate at intervals of a week till the corn is too large to pass through it without injury. Cut up as soon as

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the corn is well glazed, five rows in one, shocks good size, but not so large as to prevent curing. Husk when the cob is sufficiently dry to prevent mold. Product from forty-five to sixty-five bushels per acre, according to the soil and season.

Barley.—I harrow corn stubble with crotch harrow, then plow eight inches deep same way, and harrow again; drill, two and a half bushels per acre and roll with cast iron roller. Cut with scythe or reaper before fully ripe, and rake and cock as soon as possible, letting it remain thus till well cured, then store in barn and thrash at convenience; product from twenty to forty bushels per acre.

Wheat usually succeeds barley in the rotation, though sometimes the soil is prepared by fallowing. Barley stubble is plowed shallow as soon as the barley is harvested, and harrowed. All the barley left upon the ground will germinate and grow. Then apply rotted manure to the poorest portions of the field and plow the second time eight inches deep, harrow, and drill, two bushels per acre; product from twenty to thirty-five bushels per acre. I seed with clover and timothy, and use for meadow and pasture two or three years.

Oat land is prepared in the same manner as for barley, drill three bushels per acre; cut before fully ripe and cure in the swath; when dry bind and store in barn. Oats should not be shocked, as it makes unnecessary labor, and they are liable to injury in wet weather.

Potatoes.—I raise on sandy loam soil prepared in the same manner as for corn, except that I use no manure; mark one way with small plow three feet apart; cross with marker three feet eight inches; cut potatoes so that each piece will have two eyes, and put three pieces in a hill; plant same time as corn or earlier if possible; cultivate same as corn at first, afterward pass through each way with shovel plow and dress with hoe; harvest when ripe, which is indicated by the decay of the tops and withering of the small strings which connect the tubers.

For *buckwheat* I prepare the ground as for other summer crops; sow broadcast eighteen quarts per acre, about 4th July, and harrow in; product twenty-five to thirty-five bushels per acre.

Turnips.—I have raised but few turnips, but think them a profitable crop. I prepare the soil by plowing and harrowing,

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sow broad-cast about 25th July. I cannot now state the quantity of seed sown; product about 400 bushels per acre; Norfolk variety. I cultivate the usual garden vegetables. No insects injure my crops, except the Wheat midge and Hessian fly. The former has heretofore caused a diminution of yield of about one quarter part of the crop, until the present year, during which its ravages have almost entirely ceased. The only remedy I know of is to sow early, and early varieties. The fly has been more destructive the present year than usual, owing I think to the early sowing which has been practiced for the past five years, in order to avoid the midge. Late sowed wheat is not so liable to be destroyed by the fly. I have made no estimate, nor can I give any of the value of the fertilizing matter taken from the soil by an acre of wheat.

15. Same answer as to number ten.

16. I plow under manure for corn from six to eight inches deep; apply rotted manure as top dressing to wheat and meadow. I generally prefer to plow under manure as it gives more lasting benefit.

17. My potatoes have been affected with rot. I do not know the cause, and know of no remedy except early planting on warm sandy soil without manure and early harvesting; product 100 bushels per acre.

18. My grasses are clover, timothy, and occasionally white clover; use six quarts of clover, and the same quantity of timothy seed per acre. For meadows I sow timothy, broadcast, in the fall, previous to drilling the wheat. I sow clover on the transient spring snows. For dairy purposes I prefer timothy and white clover.

19. I mow nineteen acres, and the average product is two tons per acre. I cut clover when the heads become brown, and timothy when the seed is formed, but before it shells. My mode of making hay is to cut with mower, let it lie in the sun till partially wilted, put in cock and let it remain till cured; if clover, give a few hours of sun before it is placed in the mow.

20. My meadow land is all suitable for the plow.

21. I have not practiced irrigation though my farm possesses unusual facilities for so doing.

22. I have reclaimed about twelve acres of wet miry land in a body. The mode pursued was to cut a large open ditch on the upper side, from three to six feet deep, which cut off the heads of

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several large springs. The remainder was under drained, using stone procured from the same field. About three-quarters of a mile of drain was constructed in the spring, and the land fallowed and sowed to wheat in the fall. The yield was 35 bushels of wheat per acre. It was previous to being drained, entirely unproductive, being so wet that a team could not pass over it in many places. I have also reclaimed several other wet places on my farm, and the results have been equally satisfactory.

23. I have not yet succeeded in thoroughly eradicating all the weeds from my farm. I do not allow any to go to seed and they are gradually diminishing. Fallowing is the best means of eradication. The most troublesome weeds are red root and Canada thistles.

24. *Domestic Animals.*—I keep one yoke of oxen, a cross of Devon and native; seven cows, part of them native and part a cross of Devon and Durham; ten young cattle, crosses of native, Devon and Galloway; eight horses, common breed, and Samson grades.

25. I have made no experiments to show the relative value of the different breeds of cattle.

26. I consider the best and cheapest manner of wintering cattle, is to feed regularly with corn stalks, allowing them access to the straw stacks, and eat what they will. Good barn cellars and sheds are provided for their comfort, and plenty of good water is always accessible. I feed hay occasionally for a change.

27. I make no cheese. I make about 1,050 lbs. of butter annually from seven cows. My mode of manufacture of butter is to keep the milk in clean shallow vessels, remove the cream when fully risen, churn every second day, which is performed by a sheep; the butter is taken from the churn and thoroughly washed with pure cold water, slightly worked and salted with Ashton salt. It is afterwards thoroughly worked until the buttermilk is removed, and packed in oak firkins or stone crocks.

28. I keep thirty sheep, Leicester breed. Their fleeces will average five lbs. The wool sells from 25 to 45 cents per lb. About half of my flock produce lambs, about twenty in number of which are annually raised. My sheep when fat sell from $6 to $9, and lambs, at two months old, at $2 per head to the butcher.

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29. My sheep are kept entirely on corn stalks till about the middle of February, after which I feed ewes with lamb with clover hay, and an allowance of shorts, oats, or other grain, with turnips and swill. I seldom lose a sheep during the winter; fine wooled sheep are less hardy and more liable to die in winter than coarse wooled.

30. I keep from 12 to 20 swine, a cross of Suffolk and Leicester. During the summer they run in clover pasture and are fed with milk and slops of the kitchen, and with late summer and fall apples. They are put up 1st of September, and fed regularly with cooked potatoes, pumpions, apples, refuse grain, ground and soft corn; giving them sound corn a few weeks before killing, which is done at about 8 months old; weight from 200 to 250 lbs. I keep few swine during the winter except breeding sows.

31. I have made no accurate experiments showing the relative value of potatoes and other root crops compared with Indian corn, or other grain, for feeding animals, for fattening, or for milk.

32. *Fruit.*—I have two hundred apple trees of grafted fruit, approved varieties, (chiefly Billy Bond, Fall Orange, Rhode Island Greening, Esopus Spitzenburgh, Baldwin, Seek-no-further, Roxbury Russet, &c.)

33. I have seventy fruit trees exclusive of apples, of which twenty-seven are cherry, (varieties, Yellow Spanish, Black and White Tartarian, Oxheart, and May Bigarreau;) three pears, (Virgalieu, Seckel, and Harvest;) fifteen peach, (varieties, Crawford's Early, Large Red Rareripe, &c.;) twelve plums, (varieties, Washington, Egg, Common Blue, and Green Gage;) five quince, (Orange variety.).

34. My plums are somewhat affected with the curculio, though to no great extent. Catterpillars attack my apple trees; the remedy is to destroy them as soon as they make their appearance.

35. I cultivate my orchard while the trees are young, and keep the soil loose and rich; after the trees have attained considerable growth I seed down with clover and apply manure to the roots of the trees, breaking up the clover lay every three or four years and use for a crop or two. I use the saw and knife for pruning, which is usually performed in spring.

36. I have made no other experiments on farm operations, of which I have sufficient data to render accurate or important.

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37. The number of my farm buildings is eight, exclusive of two tenant houses. My buildings are all constructed of wood and in a good state of preservation and repair; dwelling, upright 34 by 34, wing 24 by 20, leanto 24 by 14, generally repaired and renovated in 1849, with modern style and improvements. Its value is $2,500. I have two barns, one of which is 50 by 40, 20 feet posts, sided vertically, on a wall eight feet high, forming a basement which is used for storing implements, and shelter for young cattle and sheep. The upper portion is used chiefly for grain. Attached to it are two sheds—one on the north side is 50 by 40, 18 feet posts, a portion of which is used for stables and the remainder for hay. The other barn is 50 by 20, 16 feet posts, the lower part open and the upper part used for hay. The other barn, 15 rods east of dwelling, is 50 by 35, 18 feet posts, with basement, used for stabling cattle, sheep, &c.; the upper portion for grain. Attached on north side is shed, 50 by 22, 16 feet posts, lower part open shed, upper part hay loft. My carriage house and horse barn, erected the present year, 51 by 24, 17 feet posts, sided vertically with dressed pine boards and battened, and painted with lead, zinc, and oil. The front portion on the lower floor is used for carriages, and in the rear are stalls for horses. The second story is used for hay. The corn house is 30 by 20, capable of holding 2,000 bushels of corn in the ear.

38. *Fences.*—I make my farm fences of posts and boards, and of rails. I have in all 1,200 rods of post and board fence, and about 650 rods of rail fence. The board fence cost about $1 per rod, and is in good condition. Rail fence cost about 75 cents per rod when staked and wired. I have constructed no wire fence.

39. Whatever grain or other farm produce is sold is accurately weighed and measured—that used by myself is measured. I do not keep a daily account of all farm transactions, and especially of produce sold, but occasionally make accurate entries of the whole.

40. I keep a farm account, and can state the annual expense in improving my farm, and the income from it, and can strike a balance of debt and credit at the end of the year. This practice is beneficial in introducing close observation of all farm operations, and consequently profitable.

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The receipts and expenses of the year commencing on the 1st day of January, 1855, and ending on the 31st December, are as follows:

FARM EXPENSES, 1855.

Self eight months and board, $20,	$160 00
Man one year and board,	187 00
Boy nine months and board, $12.66,	114 00
Man thirty-four days and board, 8s.,	34 00
Four days corn planting, 8s.,	4 00
Three days hoeing, 8s.,	3 00
Man twelve days and board, 8s.,	12 00
Sixty-two and three quarters days harvesting, 14s.,	114 81
Nine and a half days cutting corn, 8s.,	9 50
Paid for husking corn,	25 00
Paid for plow,	8 00
Paid for corn cultivator,	7 50
Paid for seed drill,	80 00
Blacksmith bill,	40 00
Paid for thrashing,	37 00
Board of extra hands,	3 00
Keeping teams for thrashing,	6 00
Plow points,	4 00
Materials for new fence,	25 00
County taxes,	70 00
School taxes,	4 75
Building new fence,	23 00
Two swing gates, 20s.,	5 00
Four bushels seed corn, 8s.,	4 00
Ten bushels seed potatoes, 6s.,	7 50
Fifty-four bushels seed winter wheat, 15s.,	101 25
Six bushels seed spring wheat, 22s.,	16 50
Thirty bushels seed oats, 65c.,	19 50
Four bushels seed buckwheat, 6s.,	3 00
Sixty-two and a half bushels seed barley, 9s.,	70 31
Half bushel large clover seed,	5 00
Two and a half bushels small clover seed, $7,	17 50
Three tons gypsum, $3.84,	11 52
Four hundred loads manure, 1s. 6d.,	75 00
Keeping two horse teams six months,	240 00
Paid for one yoke working cattle,	175 00
Paid for cutting grass and grain,	15 00
Seven butter firkins, 5s.,	4 38

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Hired girl,	110 00
Forks, rakes, &c.,	3 00
Erection of carriage house,	325 00
Erection of smoke house and fixtures,	25 00
	$2,205 02

RECEIPTS OF FARM, 1855.

One hundred and forty bushels wheat, 10s.,	$175 00
Two hundred bushels wheat, 14s.,	375 00
Twenty bushels spring wheat, 12s.,	30 00
Five hundred and eighty-two bushels barley, 10s.,	727 50
Five hundred bushels oats, 3s.,	187 50
1,050 lbs. butter, 20c.,	210 00
2,700 lbs. pork, $7.75,	207 25
One hundred pounds lard, 1s.,	12 50
One hundred and seventy-five bushels buckwheat, 4s	87 50
Ten sheep sold,	35 00
One hundred and twelve pounds wool, 2s.,	28 00
Six yearling calves,	106 00
Four hundred bushels potatoes, 3s.,	150 00
Two hundred barrels apples, 6s.,	150 00
Eight hundred bushels corn, 6s.,	600 00
One hundred bushels turnips, 2s.,	25 00
Nine barrels cider, 10s.,	11 25
Fruit, exclusive of apples,	30 00
Garden produce,	20 00
Forty tons hay, $10,	400 00
Straw of all kinds,	50 00
Stalk of twenty-four acres corn, $3.50,	84 00
Twenty loads stone sold, 2s.,	5 00
Thirty-five cords wood, $3.50,	122 50
Eleven and three-quarters cords wood, $2.25,	26 44
Fifteen cords basswood, 12s.,	22 50
Span horses sold,	320 00
Pasture for other people,	100 00
Pasture for sixteen head cattle,	115 20
Pasture for six horses,	36 00
Pasture for thirty sheep,	12 00
Pasture for 12 hogs,	15 00
Rent of tenant house,	25 00
Rent of four-fifth of acre for potatoes,	12 00

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Rent of land for mint still,	10	00
Excess of value of implements over last year,	50	00
Excess of value of farm on account of erection of carriage house, new fence, &c.,	400	00
Total receipts,	$4,973	14
Deduct expenses,	2,205	02
In favor of farm, after paying for taxes $74.75; his own services, $160; making $234.75,	$2,768	12

The cost of marketing the aggregate produce of my farm will not exceed two per cent.

Remarks.—In the above expense account I have not charged for groceries, clothing of family, &c., nor have I credited their services, as these items properly belong to family economy and not essential to show the transactions of the farm. I estimate the value of my stock the same as last year. The yield of corn is not indicated by the item of corn sold in the receipts, 375 bushels having been fed to stock, which is included in other items of that account. The average yield of corn is consequently forty-nine bushels per acre. My crops are full one-fourth less this year on account of the wet season. Wheat was much injured in quantity and quality by wet weather in harvest. It sold for thirty-five cents less per bushel on that account. The present year has been very unfavorable to the production of a satisfactory farm account and balance sheet.

JOHN WESTFALL.

Lyons, January 1st, 1856.

James McLallen's Farm, Trumansburg, Tompkins county.

B. P. JOHNSON, ESQ.

Dear Sir: Since your visit to my house with Mr. Morrel, in July last, to look at my farm, I have, for a good part of the time, been so unwell that I have not been able to attend to any business of consequence. As the time is drawing nigh that my report should be sent on, I sit down to the task. Owing to my ill health, I shall not be able to make it as full as I would like.

My farm contains about 159 acres, lying in the village of Trumansburg, it being a part of the farm of my deceased father, John McLallen. I purchased most of it of the heirs at

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different times since 1848. Previous to that time, and since, I have been engaged in the mercantile business in this place since 1823. My health failing, and not being able to bear the confinement in the store, I had to quit it, and concluded to try farming, which would give me exercise in the open air; I did so, with decided benefit, and have good reason to believe, under Providence, it has been the means of prolonging my life until this time. I commenced without any practical experience in the business. At the time I did not expect to make it profitable. I found there was much to be done; a good portion of the farm needed ditching, there were many large oak, pine and other stumps to be removed, fences mostly worn out, and requiring to be made new; had no barn to store the products of the farm in. I commenced with making repairs to fences and building new, ditching the fields as fast as I could, removing the stumps and stones from my fields, made and procured all the manure I could obtain, applied the leached ashes made at my potashery, seeded down to clover, &c., and have subsoiled about forty acres on the farm, and cleared off seven acres of wood land, and have the greatest portion of the farm well fenced.

In reviewing the past I can discover in a great many cases where I have missed it. I have been imposed on by my workmen, deceived by following the directions of writers in the agricultural papers, and various other ways. I would not speak disparagingly of agricultural papers; I feel that I am greatly indebted to them for what little success may have attended my efforts in this new branch of business for me. I soon came to the conclusion that farming, as all other branches of business, in order to be successful, required to be thoroughly attended to. I have aimed to procure the best implements for my men to work with, the best seeds to propagate from, put in my crops in the best order and in good season, and find I have no reason to complain of a liberal expenditure on my farm in labor, manure, &c., as it pays back a good interest. I like the business, although I meet with many disappointments and perplexities in carrying it on.

I am confident my farm has more than doubled its products within the last three or four years, from what it produced before I bought it.

1. *Soils, &c.*—My farm contains 159 acres; on it is sixteen acres of wood land. I should judge there were thirteen acres

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in roads, swamp and waste lands along the creek that runs through it.

2. In answer, I would refer you to a rough map of the farm accompanying this. Field No. 1 is a wood lot; on it is a swamp in which is marl, from which there is a small stream running into the main creek. No. 2 I had cleared about four years ago; clay predominates, some gravelly knolls. No. 3, side hill, gravelly loam; bottom land clay, muck, &c. No. 4, mostly clay, with gravelly spots mixed with limestone; in this field is an old apple orchard of about sixty trees, mostly grafted. No. 5 is a black ash swamp, except eight or ten acres of first rate tillable land, thoroughly ditched, soil loam and clay, with gravelly spots; a part of this field was planted to corn when you viewed it. No. 6, black loam top, clay bottom, sandy in places. No. 7 very similar, more limestone, lays higher. No. 8, side hill and bottom land; side hill gravelly, clay bottom; flat muck and made lands from wash of hills, clay bottom, soil filled with limestone, gravel and small stones; most excellent land to produce. No. 9, loam, clay bottom, some places gravelly, interspersed with limestones. Limestone abounds in all the fields on the farm. Scattered over the farm were many large granite bolders, some of sand, limestones worn smooth; along the creek most excellent building stone, dark blue; also fire stone and soft shale, that dissolves on exposure to the air. In the creek, between the fissures of the rocks, I have found stone coal in small quantity. Marl in my swamps.

3. Of clay soil, my practice has been to seed down with red clover after wheat, oats, or barley; first year mow for hay, applying in the spring one bushel plaster per acre; second year, pasture and take off a crop of clover seed, (use no plaster if I save seed, if not, sow one bushel to the acre;) third year, pasture and plaster; fourth year, plow and plant to corn, applying fifty loads of manure and leached ashes, (about one of ashes to five of manure;) sixth year, sow to oats or barley, as the soil fits best. As soon after harvest as I can haul on the manure made previous year, plow under about seven inches deep. When the manure is applied as a top dressing, plow from nine to ten inches deep, drag and drill in two bushels wheat to the acre; sow on six quarts of timothy seed to the acre and roll the ground. The following spring sow eight quarts clover seed to the acre and one bushel plaster. Formerly I did not

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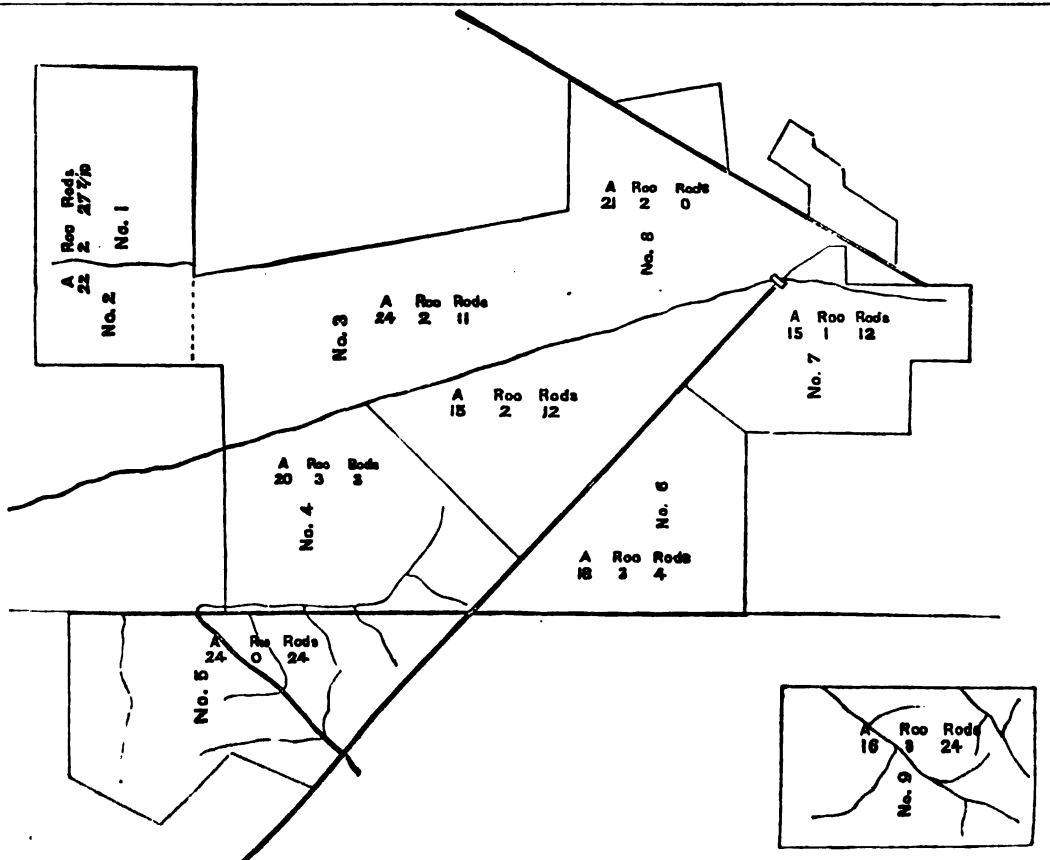
A Roo Rods 22 2 27½ No. 1
No. 2
A Roo Rods 24 2 11
No. 3
A Roo Rods 21 2 0
No. 8
A Roo Rods 15 1 12
No. 7
A Roo Rods 15 2 12
A Roo Rods 20 3 8
No. 4
No. 6
A Roo Rods 18 3 4
A Roo Rods 24 0 24
No. 5
A Roo Rods 16 3 24
No. 9

FARM OF JAMES McLALLEN, TRUMANSBURGH, TOMPKINS COUNTY.

[150.]

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put on as much grass seed. The quantity above named I find from my experience to be about right. On my sandy and gravelly soils, top dress with composted manure and plow light.

4. Plow on heavy clay soil from eight to ten inches, and subsoil if I can; on sandy and gravelly soil, six inches. I find on these soils, deep plowing permits the manure to waste more on that and subsequent crops. I have subsoiled of my clay bottoms, in all, about forty acres; have found it greatly improved the crops, particularly grass; they succeed better on the wet, and stand the drouth much better by so doing.

5. Have found that shallow plowing on clay lands, the crops were not as good as deep plowing. On sandy gravelly lands, light plowing the best.

6. I have subsoiled field No. 6, parts of Nos. 4 and 8, in all, forty acres. Am well pleased with its effects—loosening the soil to a greater depth, permitting the air and moisture to penetrate deeper in times of drouth, and the excess of moisture to more readily pass off. I have drained fields Nos. 3, 4, 5, 6, 7, 8, and 9. In field No. 6 I had 187 rods of ditch put, in summer of 1850, from three to four feet deep. Previously to my owning it there may have been 150 rods put in. I ditched out the corner (about an acre) last spring and planted beans. I have stone hauled, and intend to put in this winter and next spring 150 rods more in same field. Since ditching this field I have had two crops of wheat in succession, yielding over twenty bushels per acre both crops, thirty-five tons of hay the dry season, pastured one season and took off a crop of clover seed; the last summer planted corn and had a fair crop, quantity I have not ascertained, having, on account of the continued wet weather in the fall, hauled to my barn and sheds what we could stow in them. Since which time, the weather being pleasant, have been engaged in putting in seventy-five rods of ditch, filled with cobble-stones, and covered with gravel in the walks around my nursery and green-house.

7. *Trees, &c.*—I give you the common names, viz.: White, red, and black oaks, sugar and soft maple, pine, hemlock, white and black swamp ash, whitewood, chesnut, hickory, butternut, cucumber, buttonwood, ironwood, red and white beach, wild cherry, dogwood, wild plum, crab apple, white, slippery, and swamp elm, black walnut, some old Indian apple trees still remaining, that were bearing trees when the country first settled.

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Plants and Weeds, &c.—Burdock, yellow dock, bull and Canada thistles, mandrakes, mullens, skunks' cabbage, smart weed, spice bush, sweet and black elder, poke root, blackberry, thimble berry, black raspberry, spikenard, and probably many others that do not now occur to me.

8. *Manures.*—Fifty loads per acre; I stack my wheat straw in my barn yard; put my oats and barley straw in my barn to be fed out to my stock as needed, my cattle having access to my straw stack; in winter haul into my barn yard from the swales as much muck as I think necessary and spread over the yard; in the spring pile the whole either in my yard or haul to the field and pile where I wish to use it in the fall; procure all the dead horses, cows, &c., I can, put them near the top of the heap and cover with a few loads of horse manure, by fall there will be nothing but the bones to be seen, and it adds greatly to the value of the manure.

9. I do not sell any hay straw or corn stalks from the farm; keep sufficient stock to eat all I raise, and in addition purchase several tons of hay annually; I furnish straw to the two tavern keepers in our place for bedding for their stables and have what manure they make; purchase all I can, paying fifty cents per load for what I can draw on a two horse wagon; I hauled out last year about 1,000 loads from the mill pond in our village, deposite of leaves, &c., a part of which I applied on the gravelly portions of my wheat grounds, and on the knolls in field No. 7, where I sowed oats and barley last spring; could very plainly see the difference where it was applied. There is one objection to using it directly from the ponds, on account of the seeds of noxious weeds in it; I think it is the better way to compost it with other manures one year before applying it to the land. I have an ashery from which I get about 2,000 bushels of leached ashes yearly, which I apply on the gravelly portions of my land in compost heaps, for corn, &c.; I consider them very valuable; I have also applied them as top dressing on my meadows with great benefit; collect all the old bones, boots, shoes, chip manure and other rubbish I can; haul from the swales into my barn yards, leaf mold from the woods, &c.; have a slaughter house in my barn yard, which adds considerable to the pile and affords good living for several hogs. My manure is not kept under cover; should much prefer to, and intend to do so as soon as I can. I make and apply 1,000 loads or more to my farm and nursery annually.

10. Compost most of my manure before applying it.

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11. I can increase my manure; I keep several hands employed the year round; in the winter and other odd spells haul from my swamps into my yards and compost heaps, adding leached ashes, refuse, lime, &c., giving employment to my men and teams when they could do but little else to advantage on the farm.

12. I have used lime to some extent; use plaster, one bushel per acre on my pastures and meadows; never sow it when the grass is wet; if I design to save clover seed do not use plaster; I use a mixture of plaster, lime and leached ashes on my corn crop, a handful to each hill at planting, and another after first hoeing; find it highly beneficial to the crop; I used several barrels of salt on field No. 6, after it was ditched; did not perceive it paid expenses; have not used any since. I top dress my wheat with leached ashes on the dry clay portions of the field, and manure on the wet.

13. *Tillage crops.*—About 130 acres the last season, viz: 23 acres to corn, 13 acres to oats, 5 acres to barley, 16 acres to meadow, 1 acre to white beans, 28 acres to pasture, 4 acres to potatoes, peas, roots, &c., 20 acres to nursery, 20 acres to wheat, 16 acres to wood, 13 acres in roads, swamps and waste lands along the creek that runs through my farm.

14. *Seed.*—For wheat drilled in 2 bushels, broadcast 2½ bushels; oats drilled in 3 bushels, broadcast 3 bushels; barley drilled in 3 bushels, broadcast 3 bushels; peas drilled in 4 bushels, broadcast 4 bushels; beans drilled in 30 quarts small, 1⅛ bushel large kind. Sow wheat from 1st to 20th Sept.; rye same; barley and oats from 20th April to 1st May; peas as early as I can—have sown them late in the fall and they did well. Plant beans from 20th May to 1st June; corn from 8th to 15th May.

Insects.—In wheat, the Wheat midge and Hessian fly; know of no remedy; think early sowing the best. In corn, the grub or cut worm; only remedy is to catch and kill them; they were unusually destructive last spring.

I have not made any estimate as to value of fertilizing matter taken from the soil by an acre of wheat; should think the loss to be twenty or twenty-five per cent of the amount applied to the soil.

Cultivation of Wheat—Usually sow after oats or barley; plow from eight to ten inches deep, follow with wheel cultivator, drag and drill in two bushels seed per acre; sow on six quarts timothy seed per acre; roll the ground; next spring sow eight quarts

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clover seed and one bushel plaster per acre; cut with reaper; yield from twenty to thirty-three bushels per acre.

Corn.—Plow clover lay of three years, eight to ten inches deep, use the wheel cultivator and drag until the soil is made fine and mellow; mark out with marker three feet three inches apart, both ways, drop a handful of mixed lime, ashes and plaster in each hill before planting. As soon after the corn comes up so that we can see the rows, go through with the cultivator twice in a row each way; do this again, then hoe, applying another handful of ashes and plaster to each hill; after this go through once more with a shovel plow once each way. When ripe cut and put in stouts of twenty-five hills each; husk, sorting the soft from the sound corn when husking; save my cobs to burn in my cook stove. Average yield 100 bushels of ears per acre.

Oats and Barley.—After corn plow early in the spring, drag and sow three bushels seed broad cast in preference to drilling. Cut with cradle, scythe and reaper, as suits best. Average yield of oats per acre, sixty bushels; average yield of barley per acre, forty-five bushels this year, thirty-two bushels last year.

Manures.—For wheat composted manure; seldom apply any in its long or green state; usually spread manure and plow in; top dress and drag in occasionally.

16. Manure for wheat on clay soil six inches deep; muck soil same; sandy soil, top dress and drag in; oats and barley same.

17. *Potatoes.*—Heretofore they have been greatly injured by the rot; suffered less last year and but trifling this year. Have not discovered the cause, or found a sure remedy. For the two last years I have applied a mixture of ashes, lime and plaster in the hill before planting, and sowed dry ashes on the vines at different times. My crops have been injured but little.

18. *Grass Lands, &c.*—Timothy and clover about equal quantities, mixed; sow six quarts timothy in fall, and eight quarts clover the following spring, about the 10th of April. Kinds of grass cultivated: mostly timothy and clover, some red top; white clover for pasture.

19. Mowed about 16 acres the past season. Yield, first crop, as weighed on Fairbanks' hay scale, 28 tons 1032 lbs.

Second crop,..... 8 " 1500 "

37 " .532 "

Also saved clover seed from six acres, not yet thrashed.

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Commence cutting my grass from 1st to 4th July. Mow and leave in swath one or two days, as weather permits. Rake up with horse rake and put in moderate sized cocks. Stand in cocks one or two days; open A. M., haul in P. M.

20. There is no mowing land unsuited for the plow.

21. I have not practised irrigation.

22. I have about eighteen acres, field No. 6, reclaimed by ditching. In field No. 5, is a black ash swamp. I have had the timber cut off, put an open ditch through it, which has drained it, so that I get a good yield of early pasture. My design is to thoroughly ditch it, and I think I can make it as valuable as any part of my farm. It will afford me a large quantity of muck to haul out to my compost heaps.

Since ditching No. 6 I have had two crops of wheat in succession, yielding, first crop, twenty-five bushels, and second crop over twenty bushels per acre. Seeded to clover; cut thirty-five tons of hay on eighteen acres. Pastured one year, and good crop clover seed. Planted to corn last spring; amount of crop not ascertained, as a part is in my barn and sheds unthrashed.

23. *Weeds.*—Canada thistles most troublesome. Summer fallowing most effectual way to exterminate them. I have destroyed a number of patches by letting them grow till after blossoming; cut them, and keep the tops cut off and they will die.

24. *Domestic Animals.*—One yoke working oxen, one yoke fatting oxen, three three year old steers fatting, five cows, one two year old heifer, seven yearlings, three spring calves, one Durham bull, one span team horses (large, heavy and stout), one French Canadian stud (large, heavy and stout); use him before one horse cart; for many purposes he will do as much as a span of horses and wagon; he makes a profitable team for me. One pony, ten hogs (seven fatting, three to keep over), sixty-five sheep until last fall; sold them at $2 per head; native sheep; flock had been on the farm six or eight years.

25. Have not made experiments as to the value of different breeds of cattle.

26. In winter keep my cows under shed or stable, chained to stanchions before the feeding place. Feed on corn stalks and hay, with pumpions, carrots, or slops of bran daily.

Young cattle run to straw stack in barn yard; foddered with corn stalks, chaff of my wheat, oats and barley, which I have put under shed at thrashing time. I have running water in

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my barn yards, brought in pipes from side hill back of my barn. My oxen I keep in stalls under open shed; feed on stalks and hay, with four quarts each of corn and cob meal daily.

27. *Butter and Cheese.*—I do not make any cheese. I am not able to give a correct account of the quantity of butter made, having a large family and a number of workmen to supply; am also supplying milk to several families daily by the quart. I aim to keep the best cows I can procure.

We pursue the ordinary mode of making butter. Milk strained into six and eight quart tin pans; stands until milk sours; skim cream, put into tin cans remains until sour; churned in common dash churn; butter thoroughly freed from the buttermilk by working with the ladle; mixture of fine table salt and powdered loaf sugar added, and thoroughly worked into the butter; do not wash the butter; pack in stone jars and it will keep good and sweet for a year or more.

28. *Sheep.*—I have usually kept about sixty, native breed, mostly ewes. Average yield of fleece 3¼ lbs.; sold for 34 cents per lb. Raised about twenty-five lambs yearly. Sold off my whole flock last fall at $2 per head.

29. I kept my sheep in open yard back of my shed, separate from my cattle, in which is running water brought from springs in the bank. They could go under a part of the shed for shelter when they choose. Fed them last winter on cut stalks, straw and hay mixed, with the addition of refuse beans, oats and corn daily. During the winter hauled hemlock boughs and gave them to eat. Kept salt in troughs, so that they could supply themselves when they chose. Annual average loss I should judge to have been one in twenty. I have not kept any fine wool sheep.

30. *Swine.*—I keep one breeding sow, Suffolk breed; aim to have her drop her pigs about the 1st of April; feed the pigs well; fatten in fall and butcher at nine months old; weigh from 200 to 300 lbs. One of my last spring pigs, butchered a few days since, weighed, dressed, 320 lbs. Feed on soft and hard corn, slops from house, &c.

31. I have not made any experiments as to the relative value of the different kinds of food.

In nine hogs, butchered January, 1854, the average shrinkage in dressing, from live weight, was 35 lbs.

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Another lot, three hogs, live weight, ...	1,050 lbs.
When dressed,.....	856
Shrinkage, ...	64
Another lot of two, one hog, live weight, ...	520
When dressed,.....	422½
Shrinkage, ...	97½
One hog, live weight, ...	230
When dressed,.....	190
Shrinkage, ...	40

32. *Fruit.*—Have sixty apple trees in bearing, mostly grafted, chiefly Tompkins County King, R. I. Greenings, Esopus Spitzenburgs and Yellow Bellflowers. Set out 100 apple trees last spring of above varieties and Red Canada, Newtown Pippin, Talman's Sweet, Roxbury Russet, Jonathan, Swaar, Wagner, &c.

One hundred pear trees, fifty varieties—Bartlett, White Doyenne and Seckel, among the best.

One hundred peach trees—George 4th, Morris White, Red Rareripe, Early Crawford, among the best.

Cherries.—Black Tartarian, Elton, May Duke, Downton, Yellow Spanish, Napoleon Bigareau, &c.

Quinces.—About half dozen trees left; most of my trees died last spring; the borers are very troublesome in them.

Plums.—I have but three or four plum trees. The black knot and curculio have been so destructive we dare not attempt to raise them. The black knot is not as bad as formerly, and people are beginning to cultivate them more.

Grapes.—Isabella and Catawba; the latter does not always ripen with us.

34. Insects most troublesome are the borer, in the apple, quince and peach trees, and the orchard catterpillar, curculio in plums. I find no remedy for the borer only to examine the trees yearly, dig out the borers or kill them with a pointed wire.

35. My old orchard is in grass, which I plow with the rest of the field in the regular rotation of crops, applying manure and refuse lime to the trees.

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For my orchard set last spring, I covered the ground at the rate of over one hundred loads of compost manure, muck from swales, and leached ashes, per acre; plowed as deep as I could with common plow, followed with subsoil plow; dragged and rolled the ground; set the trees about forty feet apart; between the orchard rows set out young appletrees; root grafted last winter for nursery purposes.

36. My experience in soaking my seed corn has induced me to abandon the practice.

37. *Fences, Buildings, &c.*—I have a grain barn 34x50 feet, built against north side of hill; stone wall three feet thick and eight feet high, next to bank; drive into barn on north side; thrashing floor 17x50 feet; from south end of thrashing floor to the ground ten feet; four bays on west side of the barn 12x50 feet; heighth of posts from thrashing floor to plates sixteen feet, from bottom of bays twenty-five feet; under the thrashing floor open to the south is shed 17x50 feet; from south end of thrashing floor to the ground ten feet, making it very convenient and a great saving of labor in stacking the straw and in storing the chaff underneath the shed.

Adjoining this barn, on the west, on the same level, I moved another barn 30x20 feet; wall on back side, continued same height as the other barn; occupy the floor of this barn for storing thrashing machine, fanning mill, plows, reaper, drill, &c.; underneath this barn is hog pen, place to put their feed in and lock up; another pen in which I can put my spring calves, sheep or any thing else I may wish to keep separate from my other stock; have running water under this barn, brought in pipes from hill in rear of the barn, through the wall into a reservoir, from which it is conveyed in lead pipe into penstock and trough under the south-west corner of my large barn; so if I wish to divide my yards at any time, there will be water in each yard that the stock can have access to at all times.

To the south-west of the latter barn and adjoining it, the stone wall continued same height as the other, I have a shed seventy-nine feet long and twenty-two feet wide; posts seventeen feet high; open shed ten feet high under the whole, in which I have stalls made for the stock I may wish to put in, with a passage eight feet wide next the wall and in front of the feeding place, so that I can go under cover to feed my stock from my large barn the whole length of the shed. At the south-

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west end of the shed I have a yard fenced off in which the water from the bank is conducted; in this yard I keep my sheep; they can pass from this yard through a door in the end of the shed for shelter when they choose.

I have near my dwelling house a horse barn and carriage house, 24x44 feet, to which is attached a shed for my cows, about 14x40 feet.

I have a corn house about 16x24 feet; (also a hen house and yard, which is a poor investment); also have a brick smoke and ash house about 8x10 feet square.

I have a capacious and comfortable dwelling house well furnished and painted; cellar under the whole.

38. *Fences.*—I have forty rods of stone wall, two feet high above ground; posts set into the wall and two boards nailed to posts; the earth banked up each side of the wall; stones gathered from the field.

The residue of my fences consist of post and board fence, four boards high, cap one and a half inches thick—furrow thrown up on each side of fence to bottom board; and of similar fence without caps; and of rail fence eight to nine rails high with stakes and wired; and of similar fence without stakes.

I have not constructed any wire fence; I prefer stake and wired fence, taking cost and every thing into consideration. I estimate one rod of rail fence sixteen rails to the rod:

Black ash worth,.....	48 cts.
Stakes and wire,.....	8 "
Laying, staking and wiring,.....	4 "
Cost per rod, ...	60 cts.

Post and board fence costs from $1.00 to $1.25 per rod.

39. Since April, 1848, I have kept a regular account each night of what each man in my employ did through the day. Can by referring to my daily record, tell the amount of labor bestowed on each crop. Owning a pair of Fairbanks' patent iron hay scales, I weigh each load of hay as drawn in. Measure and weigh all my grains when thrashed.

40. I keep regular farm accounts.

41. I have partially made out the expenses of all my summer crops and the receipts for past year. Not having husked all my corn, thrashed clover seed, beans, rye, &c., I am unable to complete it.

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42. Living in the village where there is a market for all I can raise, the cost is trifling. We have two miles land carriage to the lake, where our produce is shipped to market.

Yours, respectfully,

JAMES McLALLEN.

January, 1856.

Crops of James McLallen, raised 1855.

[We give a portion of the account book of Mr. McLallen, showing the manner in which he keeps the records of his farm expenses, and the returns from his various farm operations.]

Dr.

Two acres of rye.

Two and a half days' plowing, 16s.,	$5 00
One day's dragging,	2 00
Four bushels seed, 8s.,	4 00
Drilling in,	1 00
Three days' cutting and putting up, 10s.,	3 75
One day's hauling,	2 00
Not thrashed, say	2 00
Interest on two acres land at $60,	8 40
	$28 15
Balance carried down,	19 35
	$47 50

Cr.

By thirty bushels of rye, by estimate of my farmer, (not yet thrashed,) 10s.,	$37 50
By straw, (worth to me for nursery purposes, tying up trees, &c.,)	10 00
	$47 50
By balance brought down,	$19 35

Dr.

Expense of one acre of white beans.

One and a half days' plowing, 16s.,	$3 00
Quarter day with wheel cultivator,	50
Four and a quarter days' planting, 8s.,	4 25

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Seven days' pulling, 8s., ...	$7 00
Three days' thrashing and cleaning, 8s., ...	3 00
Two bushels seed, 10s., ...	2 50
Interest on one acre of land, $100 per acre, ...	7 00
	$27 25
Balance carried down, ...	$10 75
	$38 00

Cr.

Have thrashed about half of the crop, which yielded fourteen and a half bushels; other half, say fourteen and a half bushels: twenty nine bush., 10s.,.	$36 25
Fodder of same, worth, ...	1 75
	$38 00
Balance brought down,.....	$10 75

P. S.—I credit the beans at 10s. per bushel, hope to get more.

Corn crop, twenty-two acres.	*Dr.*
Fourteen days' plowing with horse team, 16s., ...	$28 00
Twelve days' plowing with ox team, 12s.,.....	18 00
Four days' dragging with ox team, 12s., ...	6 00
Thirty-four and a half days' cultivating, one horse and man, 10s.,.....	43 12
Four and a quarter days' shovel plow, 10s.,.....	5 31
Three and a half days' marking out, 10s., ...	4 38
One day's shelling and procuring seed,.....	1 00
Ten and a quarter days' planting, 8s.,.....	10 25
Two and three-quarters days' wheel cultivator and oxen, 12s.,.....	4 18
Twenty-six days' hoeing, 8s.,.....	26 00
Two and a half days' ashing and plastering, 8s.,....	2 50
Twenty-five days' cutting up, 8s.,.....	25 00
One hundred and one and a quarter days' husking, to 13th December, 8s.,.....	101 25
Eighteen and three-quarters days' with oxen and man hauling in unhusked corn and stalks, 12s., ...	28 12
Four days' do. horse team, 16s., ...	8 00

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Twenty-four and three quarters days' of men to help load and unload and mow away corn and stalks, 8s.,	$24 75
Three and a half bushels seed corn, 8s., ...	3 50
Interest on twenty-two acres, $100 per acre, ...	154 00
	$493 31
Deduct, reckon'g the labor at 70c. per day, the actual cost to me, on 190¾ days, 30c., ...	57 22
	$436 09
Balance carried down,.....	440 26
	$876 35

Jan. 8, 1856.—I have had husked and put up of sound corn, 1,154 bushels of ears; of soft corn, 479 do. My head farmer estimates there is at least 400 bush. of ears more to husk. *Cr.*

Recapitulation.

Now husked,.....	1,154	bushels sound ears.	
To husk, say.....	300	"	
	1,454	bushels, 40c., ...	$581 60
Now husked,.....	479	bushels soft corn.	
To husk, say.....	100	"	
	579	bushels, 25c., ...	144 75

A good share of this was sound. As I was feeding several cattle and hogs, we did not put as much as we might have done with the sound corn.

Forty-four tons stalks, $2.50., ...	110 00
Say forty loads pumpkins, (I can't tell the exact quantity; my horse team drawed one and a half days, and my ox team nine and a half days, after hauling each morning a load of ditch stone from my other farm,)	40 00
	$876 35
Balance brought down,.....	$440 26

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P. S.—Sixty lbs. shelled corn will make fifty-seven lbs. sifted meal, costing 7c. for grinding. If sixty lbs. shelled corn is worth 75c., and cost of grinding 7c., in all 82c., and it makes fifty-seven lbs. meal, at 14s. per 100 lbs., it makes the shelled corn worth $1 for sixty lbs. Meal is now selling for 14s. to 16s. per 100 lbs.

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Recapitulation.

	Expense.	Yield.	Profit.	Profit pr. acre
Expense of barley and oat crops, interest on land, &c., (18 acres,)	$316 99	$534 54	$217 55	$12 08
do of two acres of rye,	28 15	47 50	19 35	9 67
do of one acre of white beans, (large horticultural,)	27 25	38 00	10 75	10 75
do of twenty-two acres of corn,	436 09	876 35	440 26	20 01
do of six acres of clover seed,*	.....	.....	.....	
Potatoes,	.....	50 00	50 00	
Carrots,	.....	5 00	5 00	
Orchard,	.....	88 63	88 63	
Thirty-two acres wheat,	481 06	852 48	371 42	11 60
Sixteen acres to hay and seed,	189 00	358 12	169 12	†10 47
	$1,478 54	$2,850 62	1,372 08	
Pasturing ten cows, at $12.75,		127 50	127 50	
		$2,978 12	$1,499 58	

* Entered in hay crop. † Besides fall crop.

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The method of making out his statement, adopted by Mr. McLallen, is peculiar, and though interesting is not to be relied on in respect to the general results, as it would be if made out in the mode usually adopted.

It will be seen on examination that he opens an account with the field which he cultivates, charging against it all the labor, seed, &c., together with interest upon the value of each field so cultivated, and his grand result is reached by adding together the profits of the several fields.

There are other expenses which must arise that cannot be charged in this account, as, for instance, the wages and board of men in bad weather, or whilst occupied on such work about the farm as repairing fences, &c. Neither is any charge made for blacksmith work, wear of implements, &c.

The accounts of Mr. McLallen, as a specimen of order and accuracy, are entitled to attention, and may well serve as a model to those intelligent farmers who would ascertain by actual experiment the relative profit of the various crops raised.

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AVERAGE *monthly temperature at Trumansburg, Tompkins county, N. Y., as kept by James McLallen, from May, 1850, to 1st January, 1856.*

	1850.		1851.		1852.			1853.			1854.			1855.		
	Morn'g.	Night.	Morn'g.	Night.	Morn'g.	Noon.	Night.	Morn'g.	Noon.	Night.	Morn'g.	Noon.	Night.	Morn'g.	Noon.	Night.
April,	.....	.....	38.27	42.3	34.25	53.22	39.28	38.29	55.3	42.3	36.14	50.6	40.20	38	52.15	42.8
May,	44.26	46.7	49.	53.28	48.30	81.6	53.5	48.3	68.2	55.11	50.2	71.7	54.27	45.14	64.16	52.29
June,	59.16	63.12	55.21	59.20	56.26	82.21	60.8	62.2	83.27	67.3	58.7	80.25	64.10	57.15	69.10	60.14
July,	63.28	65.28	61.19	65.18	62.4	93.17	67.5	60.8	84.1	64.27	66.28	88.23	69.30	64.28	78.18	68.8
August,	60	62.21	59.24	63.26	58.28	82.18	63.30	49.17	86.12	67.15	61.29	84.30	67.11	58.27	75.4	64.10
September,	51.6	56.3	56.20	61.3	50.26	76.16	56.17	55.21	75.9	59.20	57.5	76.25	62.5	55.21	68.21	59.6
October,	42.8	45.10	46.11	50.2	47.1	70.20	49.25	41.1	60.17	45.5	46.23	62.29	50.22	42.28	54.5	44.4
November,	35.14	36.17	33.4	33.5	33.2	43.2	34.28	33.5	39.5	49.10	35.8	44.13	37.19	36.1	44.7	38.8
December,	21.17	22.20	20.31	22.12	31.17	46.27	32.28	24.17	34.23	27.13	21.15	33.7	23.24	25.24	34.1	27.8
January,	.....	.....	25.7	26.12	17.22	29.30	18.10	22.25	40.9	24.2	25.12	34.15	26.12	26.19	35.8	26.3
February,	.....	.....	29.8	30.4	23.11	40.18	25.15	22.6	41.2	25.9	20	31.20	23.24	12.24	26.4	16.22
March,	.....	.....	32.26	30.20	28	45.26	29.23	30.15	50.17	55.5	29.4	42.18	32.2	25.4	36.22	28.16

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Wm. M. Holmes' Farm, Greenwich, Washington county.

The farm which I offer for your consideration lies in the town of Greenwich, Washington county, New-York. Forty-three acres were added to the farm the 1st of April, 1854, and sixty-three acres were added to the farm the 1st of April, 1853, the remainder has been owned by my father about sixteen years.

1. *Soils.*—The farm contains about 185 acres. There are fourteen acres wood, about four acres rocks, and two acres muck swamp.

2. The soil is a loam, varying from sandy to gravelly, and a few acres clay. The subsoil is mostly clay. There is no limestone in it. Our rocks are black slate.

3. The only way we have improved our different soils is by using a made manure, and not keeping up to grain too long, and taking care that they are not fed too close when in pasture. All the clay soil we have has been in our possession only two years, and has been in pasture. I think the sandy and gravelly soils pay best for manuring with barn yard manure, composted with muck.

4. We plow from six to eleven inches. We use three-horse teams, as we always have colts on hand, and let the plow go in as deep as it will. We used to plow only five or six inches deep; we now turn up what some folks call dead soil, but it proves to be just as much alive as that on the surface. One field we took possession of in 1854 had been up four years with corn, oats and flax. We plowed it three inches, on an average, deeper than it was ever plowed before, and seeded it down with oats without any manure, as it was far from the barns, and the oats and seeding turned out very much beyond our expectation. I think the deep plowing had something to do with it, but I think to turn up new soil in the fall, and let it lay through the freezings and thawings of fall and spring would be better than to turn it up and sow on the seed immediately.

5. Have made no experiments, but have formed an opinion decidedly in favor of deep plowing from common observation.

6. Have not used the subsoil plow; I like the plow, have intended to use one, but have not as yet. We have put in about 700 rods of drain tile, and about 140 rods of blind stone drain. I think tile are cheaper than stone drain, even when the stone lay near at hand, for there is so much less digging

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with tile. The effects have been astonishing, for on land that produced only swamp hay, and could not be driven on to except in dry weather, we can now plow any time of year, and raise as good crops as on any land on the farm. The soil is a loam, verging on a muck.

7. *Trees.*—White and yellow pine; white, black and yellow oak, poplar, ironwood, walnut, butternut, chestnut, elm, sugar and red maple, wild cherry and shadblow, were trees originally on the farm.

The plants are mandrake, burdock, narrow dock, mayweed, rushes, catmint, white daisy, crowfoot, strawberry, orchis family, dandelions, scurvy grass, plantain, cockle and pursley.

8. *Manures.*—We apply from thirty to forty loads per acre, according to the state of the land, and also of the manure. Our manure is made in yards, sheds, pits, &c. We draw out some in the long state during winter, for we can do it easier on the sleigh, and have more time. Whatever is left in the yard when through drawing in the spring, we throw up into a pile and leave until fall. The drainings of the yard during a hard rain, or during a thaw in winter, are carried through a ditch to a pit, into which has been thrown eight or ten loads of muck, coarse manure, and all refuse, dead dogs, cats, hens, lambs, &c. We also make several loads of good manure by carrying all soap suds and waste water through a long trough to a pit of muck, which we empty and fill as often as it is good.

9. We make about 400 loads annually, and this year but about a hundred; but buying manure I think is a bad practice, and wish to discontinue it, for we do not know where the livery stables get their hay, and hence cannot tell when a very bad weed may make its appearance, and wide-spread the first year.

10. Almost always apply manure as a top dressing on meadow, pasture or orchard, and prefer it in a rotted state, but to save time we run it out in winter in heaps in the long state, and spread it in the spring. We sometimes throw manure on plowed ground, and harrow it in before sowing and planting.

11. Know of no way of increasing my manure except by the muck bed, and that I am using as fast as I can.

12. Have used no special manures mentioned, except plaster, which we use on new seeded pieces where there is clover, and sometimes on corn; think it very beneficial; also about 400 pounds to the acre.

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13. *Tillage Crops.*—Till corn, about seven acres; oats, thirty-four; buckwheat, about three and a half; potatoes, four and a half acres, beside around the corn, beets, half an acre; turnips, half an acre.

14. *Seed.*—Potatoes, eight to ten bushels per acre; corn, three to five kernels per hill, three feet apart each way; oats, from two and a half to three and a half bushels, according to the state of the ground; buckwheat, one-half to three-fourths of a bushel. We never raise wheat, rye or barley. The time of sowing our oats is as soon as the frost is out of the ground, as we plow all our oat ground in the fall. We sow right on and harrow in, and have oats up before some of our neighbors get their land plowed. Have now over forty acres plowed for oats next spring. By this plan our oats get filled out before the drouth sets in, which sometimes makes a light yield. As regards corn we have nothing peculiar in the manner of cultivation, except that we use the shovel plow of two sizes, which does away with much hoeing. We also use it among potatoes with greater advantage. We have no insects that trouble us except the grasshopper, which sometimes, in dry seasons, eat our oats and grass. Have never tried any remedies.

15. *Manures.*—We prefer rotted barn yard manure, composted with muck. That which has the most muck in it for the land which has the most sand or gravel. The muck acts in such a manner as to prevent leaching, and we get the use of all the manure, and we prefer to apply it as a top dressing, in fall or spring as it happens to be ready. We prefer to manure the land when it is in grass, but if it is not rich when we put on grain we scatter on well rotted manure and drag it in thoroughly.

16. We think we get more benefit and get it quicker to have the manure applied on or near the surface.

17. *Potatoes.*—They have rotted, and know of no clearly proved cause or remedy for it.

18. *Grasses.*—We use clover and timothy. Use twelve quarts of timothy and ten pounds of clover per acre when used together, and use a half bushel timothy when used alone. I think that timothy, clover and red top are the best grasses for dairy purposes. We have always been in the habit of seeding in the spring with oats, but last year tried an experiment. Divided a piece of land in the center and sowed half of it with

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seed and oats together, the other half sowed oats alone, and turned it over shallow after the oats were off and sowed half bushel of timothy per acre. This was about the 1st of September, and it gave more fall feed than the spring seeding. This summer I cut the best portion of the spring seeding, and an equal portion of the fall seeding. Cut it early before the hurry came on that I might have time to be accurate about it. It was too early to get a heavy crop per acre, but it showed the relative amount as well as if cut late. The spring seeding was full of weeds and not worth so much by three dollars as the fall seeding which was all clear timothy. There was about an acre in each piece. The spring seeding gave 3,840 pounds, and the fall seeding gave 5,004 pounds. Part of the fall seeding we saved for seed, which gave five bushels and three pecks of good seed. I am so well satisfied of the profitableness of sowing in the fall and saving for seed that I have put in nine and a half acres this fall to cradle for seed.

19. We mow about fifty acres, and the average is a little less than two tons. The land that has been longest in our possession will average two and a half tons. Measured a half an acre and cut it separately, and it gave 3,010 pounds of dry hay. We cut our grass just as the blow has fallen, or just before the seed begins to ripen. Our mode of making hay depends very much upon the weather. We usually cut down in the forenoon, cock up at night, cut and spread out the cocks the next forenoon, and in the afternoon draw in or cock up. We use a mowing machine of Manny's patent and a revolving hay rake.

20. Have no mowing land unsuited to the plow since we drained it.

21. *Irrigation.*—Have not attended to irrigation, but think I shall in the following manner: There is a brook runs through our farm which after a heavy shower is about two and a half feet broad and three feet deep, and it comes from the rich fields on the hills and is turbid with fertilizing matter, and rushes past us and takes rich contributions from our fields, and carries them to the Hudson. Could by two or three rods of embankment and a gate stop that water and flood twenty acres or more, and let it run off after it has settled.

22. We have reclaimed low lands by draining, and with complete success, doubling the value of the land to say the least.

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23. We have not eradicated the weeds entirely, but manage to keep them pretty well under. Liveforever and johnswort were on the farms lately purchased; also white daisy, but we do not consider it a weed, as sheep eat daisy hay cut in the blow better than any other. We have scurvy grass and thistles, but they show very plain, especially among oats, and we pull them out.

24. We do not keep oxen or young cattle. We keep three cows all the while and buy others as we need to fat. We have five young horses that we use, two old horses, two breeding mares and eleven colts. We think we can raise a colt about as cheap as we could a steer; and when they are four years old they are worth very much more; and until this fall the difference has been still more in favor of the colt.

25. Have not made any experiments on breeds of cattle or horses.

26. Winter cows on corn stalks, chaff, roots and hay; colts on chaff and straw. Have the chaff of 1,500 bushels grain and also about 2,000 bushels of flax chaff, which we get for fifty cents a load, and cattle do well on it. Give them oat chaff in the morning, straw at noon, and flax chaff at night. Think they do better on a variety of food than on the same thing all the while, even if it is more nutritious. Consider free access to water, regular feeding and good shelter as indispensably necessary to winter stock easily and well, and another indispensable consideration is to have stock in good condition at the commencement of the foddering season.

27. We keep three cows, and have cream every morning for coffee, and milk on the table two meals every day for two families, numbering in all from twelve to fourteen members. We began to make butter the 23d of April, and have made two hundred and sixty-six pounds and nine ounces.

28. We wintered forty-nine sheep, eighteen fine wool and the rest coarse. They sheared a trifle less than four pounds each. The wool brought thirty-two and thirty-eight cents. All of the ewes but one lambed; had seven pair twins; lost six lambs in cold weather. One came in December, four in January, nine in February, seven in March, and eight in April. Part of the flock were long wooled lambs that did not have lambs, as I think it injures their growth to lamb the first year. Kept over ten in that way, for which gave twenty-two shillings in the middle of January, and was offered four dollars

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per head just after shearing. The fleece more than paid for keeping. Sold my lambs for three dollars per head; twelve were taken the 14th of May, and the rest the 1st of July. Sold three dry ewes at four dollars, six yearlings at $3.25, the 14th of May, and the rest of the flock, except the yearling ewes, on the 1st of August, at $4.00 per head.

29. Think that sheep, above all other stock, should be in good condition in the fall. They need shelter more than any other stock, and pay for it better; and they like a variety of food better than any other stock. Give them chaff once, hay next, straw next, and roots at least twice a week, and every day if we have them. Give no grain to the wintering sheep, except lambs, and very little to them. Have salt lying before them all the time, and give them now and then an armful of pine boughs, and save all the bean and pea straw and give them a little at a time during winter. Never had a sheep die by disease, and the only disease have ever known in the flock were six or eight cases of the stretches, which were cured by soap suds enema. It has been the general impression that sheep do not need water, but think from experience that they will do as much better as any stock. Did not lose any old sheep, and the lambs lost were mostly fine wool. The coarse wooled sheep are much better for milk than fine, especially in winter. Sheep were all in first rate condition in the spring, and lambs went off early. The sheep got fat in July, which enabled to sell off and give the pasture a good chance, so that we could fat a flock of wethers on it before winter.

30. Have no particular breed of swine. Buy three or four in the fall to winter, and in the spring buy a sow and pigs and fat them all off. Have now on hand four fat hogs and thirteen pigs. Intend to kill them all, but pork has fallen so much and store hogs are so scarce that I have picked out three sows to let have pigs in the spring. They will winter all the better for being part fatted. Have no particular rule for feeding or as to age when we kill, but do as circumstances seem to demand. Think no man can manage a farm according to any given rule, but he should be always at hand, and by a continued vigilance be ready to change his plans to meet the changes of the times. We began to feed our hogs this year on raw pumpkins, saving out the best to feed the fatting cows and wethers when the grass failed. After the hog pumpkins were gone we fed boiled potatoes, apples and apple pomace from our cider

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mill, mixing in corn and cob meal, gradually increasing the meal as their appetites seemed to demand. Our old hogs generally dress from 250 lbs. to 450 lbs.

31. Have made no experiments as to value of potatoes and roots compared with corn, but have formed an opinion from experience. Have been in the milk business two years, and kept from twenty to thirty cows, and I think that oats or buckwheat, or both together, will make more milk than the same quantity of corn, and costs much less; and I think that potatoes make more milk than the same value in grain, but of a poorer quality. Had rather have carrots to feed than any other root, but I never raise any, for I had rather raise three bushels of beets than one of carrots.

32. *Fruits.*—We have 148 old apple trees, and forty-one that are about twelve years old. About two-thirds of them are grafted. The varieties are Gilliflower, Seek-no-further, Greenings, Spitzenburgh, Swaar, Baldwin, three kinds Russets, Northern Spy, Maiden Blush, Sweet Spitzenburgh, Sweet Bough, Ladies' Sweet, Tallman Sweet, Pound Sweet, Early Juneating, Jonathan.

33. Besides the apples we have nine pear trees: Bartlett, Belmont and Seckel. We have eight cherry trees: Mayduke, White Heart and common red. Eleven plum trees: Bleecker's Gage, Coe's Golden Drop and large Red Native. The first named of each kind, except the apples, are the best, when we consider the productiveness as well as quality.

34. *Insects.*—The curculio have destroyed our plums. I know of no remedy. The apple trees are attacked by the borer, catterpillar, and scale louse. Ashes at the roots seem to interrupt the operations of the borer, but do not stop them entirely; he must be sought out individually and put to death. The catterpillar we rub off and burn off. We have raised trees afflicted with scale lice till almost dead, to become thrifty trees, by rubbing with soft soap thinned a little with water.

35. Prune fruit trees well, manure them well, and keep an eye out for the borer and catterpillar.

36. *Experiments.*—Have tried the experiment of being beforehand with my work, and never let it drive me, and have found it to work well. Try to have part of the spring's work done before spring comes, and the earliest moment the work is ready to be done, am ready for it. Have set out a long row of osier willows beside a brook; they have grown well so

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far, but I cannot tell yet whether they will be profitable. Think from what I have seen that if any one should put in with timothy seed, for fall sowing, a very little turnip seed of a quick growing kind, it would pay well for sheep to eat off late, and the grass would be just as good.

37. *Farm Buildings.*—We have four barns, four sheds, eight stables of thirty-seven stalls, hog house, corn house, carriage house, ice house, tool house, &c.

38. *Fences.*—We have forty-six rods of board fence, costing from nine to twelve shillings per rod; forty-eight rods of stump fence, built before my remembrance; seventy-three rods of stone wall, costing from eight to ten shillings per rod, and 1,104 rods rail fence, most of it seven and eight rails high, and upright stakes wired at top. We try to have as little inside fence as possible, as it uses up land and is expensive to keep in repair. Think eighty rods of fence throws a man out of the use of one acre of land, besides the expense of the fence.

39. Try to be very accurate with our farm accounts. We measure all our grain in a half bushel and strike it. Part of our hay is weighed, and part is estimated by the load while on the wagon.

40. Open an account with every crop, kind of stock, and business connected with the farm, just as I would with an individual. Charge all that is laid out in any form, and credit everything that is received, which course enables me to tell what part of the farm operations to increase and what to diminish. Call the time of the hands every night, and write up the day's work, charging each crop with what has been done for it.

41. The cost of marketing depends on the price of the produce. It costs five cents per bushel on grain, and six cents on potatoes. My own time have not charged to the farm when merely directing and planning the work, but when steadily at work charged it the same as for another man. Charged team work at $3 per day for old horses, and $2.50 for colt team. Have noticed in reports on farms that team work is usually charged very low.

WILLIAM M. HOLMES.

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MR. WM. M. HOLMES—EXPENSES OF FARM.

Horses.

Had on hand, two colts, three years past,	$180 00	
" " one year past,	80 00	
Bought three colts, October 6,	120 00	
" one colt, November 18,	135 00	
Black mare and bay mares,	175 00	
Old team work horses,	240 00	
Bought two colts, one year past,	132 50	
" colt,	27 50	
" one yearling,	50 00	
" one, three years past,	115 00	
" one, five years past,	145 00	
" mare and colt,	95 00	
" one yearling,	50 00	
		$1,545 00

Swine.

Had on hand four shoats,	$10 50	
Bought ten pigs,	23 22	
" four hogs and three pigs,	37 52	
Killing three hogs,	1 25	
Fed, four bush. oats, four do. buckwheat,	7 50	
" four bush. corn, four do. oats,	3 75	
" six bush. corn, 7s.,	5 25	
" thirteen bush. corn, 5s.,	8 13	
" pompions, potatoes, and apples,	48 30	
Boiling and feeding,	20 00	
		165 42

Cows.

On hand, two cows,	$48 00	
Bought cow,	23 00	
"	37 50	
"	36 00	
Bought heifer and calf,	30 00	
		174 50

Sheep.

Twenty ewes and one buck,	$55 00	
Ten ewe lambs,	27 50	
Bought one buck lamb,	15 00	
" two small ewe lambs,	50	
" twelve ewes,	22 00	
" four yearlings,	9 00	

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Bought one sheep,		4 00	
" one wether,		5 00	
" twenty-six wethers, 15s. 6d.,		50 38	
" five lambs,		17 00	
" one hundred and six ewes and wethers, 16s.,		212 00	
" one buck,		12 00	
" ten lambs,		24 75	
" eight lambs and two ewes,		23 00	
" thirty ewes and lambs,		87 00	
			564 13
Grain, crops, &c.			
Buckwheat, paid for seed, thrashing, &c.,		$17 31	
Beets, " labor,		10 80	
Corn, " "		148 34	
Potatoes, " "		9 00	
" " "		66 98	
Hay, labor, &c.,		151 29	
Early potatoes, seed and labor,		36 20	
Turnips, "		34 11	
Oats, "		213 37	
Orchard labor in picking, &c.,		47 21	
Timothy seed, labor, &c.,		4 96	
			739 57
One and a half tons plaster,		$ 9 00	
Timothy seed,		38 00	
Taxes,		62 45	
Labor,		502 36	
			611 81
Hay fed to horses, twelve tons,		$120 00	
Grain fed to work horses,		264 00	
Stalks, chaff, and straw, fed to cattle,		9 00	
Turnips and hay fed to sheep and cows,		35 00	
One hundred loads manure,		25 00	
Wear of tools, wagons, &c.,		100 00	
			553 00
Total amount of expenses,			$4,353 48

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Receipts of Farm.

Horses.

By sold two mares and one yearling,	$155	00	
" colt, four years past,	100	00	
" work team,	230	00	
" one colt, three years past,	175	00	
" two colts, four years past,	230	00	
" two colts, two years past,	245	00	
" two colts, one year past,	100	00	
" three colts, two years past,	250	00	
" one colt, three years past,	150	00	
" two breeding mares,	140	00	
" two colts,	70	00	
" one colt, five years past,	150	00	
" two colts, two years past,	145	00	
			$2,140 00

Swine.

By three shoats,	$49	20	
" four hogs—dressed, 425 lbs. each, 8c.,	136	00	
" thirteen pigs " 145 " 7½c.,	141	37	
			326 57

Cows.

By sold one cow,	$22	50	
" "	38	00	
By two cows on hand, (fat,)	80	00	
" one cow and heifer,	65	00	
" sold one calf,	6	00	
" 266 4-16th lbs. butter, 20c.,	53	36	
			264 86

Sheep.

By sold buck,	$6	00
" gave away ewe, lamb, and wether,	3	00
By sold six yearlings and three dry ewes,	31	50
" twenty-four lambs, 24s.,	72	00
" 50 lbs. fine wool, and 93 lbs. coarse do., average 36c.,	51	45
" twenty-two ewes, 32s.,	88	00
" thirty-five culls,	52	50
" four lambs, three bucks,	13	00
By killed, nineteen ewes, and sold,	81	91
By sold, eight wethers,	18	00
" fifty-two wethers,	245	50

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By twenty-eight lambs on hand, 24s.,.....	84 00	
" fifty-seven ewes, (been offered $3,75,) .	213 75	
" two bucks, ...	25 00	
		985 61
Grain, &c.		
By buckwheat, 73½ bush., 5s.,.....	$45 94	
" beets, 111 bush., 20c.,.....	22 20	
" corn, 662 bush., 7s.,.....	359 96	
" potatoes, ...	41 38	
" potatoes in orchard, ...	139 51	
" hay, ...	903 50	
" early potatoes,.....	97 72	
" turnips, 469 bush., 20c.,.....	93 80	
" oats, straw, &c., ...	798 63	
" apples, cider,.....	325 55	
" timothy seed, five and three-fourth bush.	23 00	
		$2,851 19
" sweet corn,.....	$6 10	
" pasturing cows and horses,.....	117 72	
" received for rent, three and a half acres,	24 75	
' beans and bean straw,.....	4 00	
		152 57
Total amount of receipts,.....		$6,720 80
Total amount of expenses, ...		4,353 43
Balance in favor of farm, ...		$2,367 37
After paying for taxes on farm,.....		$62 45

L. D. Clift's farm, Carmel, Putnam county.

1. This farm contains 160 acres, situate in the town of Carmel, Putnam county. The whole of this farm is adapted to farm husbandry, except about four acres of muck or swamp, which is the *mine* from which the residue of the farm is enriched.

2. *Soils.*—The whole farm is a darkish black loam; subsoil yellowish color, occasionally sand and gravel, or gravel loam. The land is very strong for summer crops and grass, when underdrained, and with deep culture; no lime stone; rocks gran-

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ite, and have been very formidable, but are mostly disposed of in fences and buildings.

3. I came upon this farm forty years since (in 1815); my first crop of grass was only five tons; the lands where tillable were worn out and much of it laid waste; I adopted a general principle which I have adhered to: To clean off the surface from brush and stone, underdrain, so that all surplus water could flow off to the running brook; deep and thorough pulverizing of the soil, and clean cultivation; manured freely; usually take two or three grain crops; lay down to grass; seed liberally. It is a rule never to attempt to till a field except to improve it and make it more productive.

4. I use a heavy plow and strong team, and plow as deep as I can; the land being somewhat underlaid with fast stone, regulates the depth in some portions. My object is to secure a deep, rich and productive soil.

5 and 6. I have not used the subsoil plow; and after the lands have been thoroughly broken up, I do not always plow so deep for succeeding crops.

7. The black and white oak, ash, chestnut and hickory, were the original trees; grape vines were abundant, too many of which I early destroyed; hazelnut and black berries were also abundant.

8 to 12. *Manures.*—Have used plaster more or less every year, until the last few years, at intervals of three and four years, one to two bushels per acre, sown in the fall or in March. This has produced the most visible effect.

I have used but very little artificial manure, depending, as I think farmers in this section should, upon the farm for manures. Have used barn yard manure and muck liberally and with good effect; and if care was taken to husband and apply all the manures that could be secured from the farm, no deficiency would very often occur. My manures are taken chiefly from my stables and barn yards, and applied at almost all seasons: To the hoed crops in their green state, broadcast and plowed under; in top dressing, I have found nothing as good as muck and manure mixed and trampled in the barn yard during the winter and applied in the spring. In the application of manure to wheat and rye crops, I harrow or plow it in lightly at the time of sowing; in wet seasons, I have found manure more beneficial when top dressed, or not turned under deep.

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13 to 17. *Tillage crops.*—The cultivation of grasses has been my great object. This is the principal staple of the farm; and my farm is in good condition and produces much better grasses than formerly. *Poor land* will not produce good and nutritious grasses any more than poor land will produce good crops of grain. My corn and oat crops have generally been good. The Wheat Midge for the last two years has been injurious to my wheat crop. *Potatoes* have been diseased more or less, and I know of no remedy. I have noticed that when potatoes are about coming to their full growth, that rainy and hot weather prove very injurious; and it seems to me that this state of weather, at this time, has more to do with the potato failure than has been generally supposed.

Corn and potatoes are planted from 1st to 20th May, three and a half feet apart, in squares or diamond form. Save my seed corn from the best ears, in the fall, and use from three to five grains in the hill; I plant in drills when the land is of easy culture, four feet apart in the rows, and eight to twelve inches in the drill, and get much more corn than from the planting in squares and with little more labor in tending the corn. I use the plow and cultivator in my hoed crops; have but little dirt put close to the growing corn and not a weed to be left in the field.

18. *Grass lands.*—As to grass lands and their importance, the address of Gov. Wright, at the late fair at Elmira, embodies more important facts than any publication I have read. This is the great interest, and is I imagine least understood by our farmers. The natural grasses of my farm, and which came in spontaneously are, the red top, timothy, june or spear grass, and the white and red clover will often preponderate upon rich uplands in wet seasons. It is a common remark with farmers, that they must plow up such and such fields to bring them into grass. Now if the land be rich and underdrained where necessary, no plowing is needed to obtain the best and most nutritious grasses for hay and pasture. I usually lay down or seed my lands upon winter grain, rye or wheat; I sow timothy seed upon rye, when the crop is put in, about four quarts per acre, and in the spring, as early as March, I sow from eight to twelve quarts of clover seed per acre. The land in wheat, I sow clover and timothy together in the spring, as I have found timothy with wheat in the fall to be injurious to the crop. I prefer the larger kind of clover for pasture and

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the smaller for mowing. The *best grasses for the dairy*, keeping sheep or fattening cattle, I find to be the natural *fine grasses* of my farm, and upon the old stocked grounds, clover hay or pasture is, at intervals, very fine for milch cows and all other stock, but I never confine stock long to it at any time.

19 to 20. *I mow* usually from sixty to eighty acres and have one hundred acres which I can mow readily. I do not always mow the same ground, as I think it is beneficial to alternate with pasture and mowing, upon old upland meadows. It is best to pasture upon new seeded meadow lands for the first and second years. The quality of the hay will more than compensate for any superabundance of hay that may grow the first year. I have never weighed the hay from an acre of my land. From the most part of my meadow I get grass as heavy as it can well grow. Give me a cool May and I have no fear for a hay crop.

Cutting and curing.—The time of cutting and curing hay, is the most important question proposed. I usually begin to cut my hay from the 5th to the 10th of June, and never I think later in the month than the 15th. I desire to have all my grasses cut in their *flowering time* if possible, except for horses, they may stand longer. My *first mown* grass always *makes the best hay.* I desire to finish haying in June, and am scarce ever later than the 20th July.

Mode of making hay.—Grass cut in the forenoon, spread out and shaked up, *even* over the ground; turn immediately after dinner, and am careful to have all green and wet locks shaken up to the air. If it is possible, and this is a strict rule with me, never to leave hay over night, without *being cocked up.* If I succeed in getting the water out and a wilt upon it, should the following day be cloudy or rainy, the hay is undergoing a curing process, and will take no injury for forty-eight hours or more. When grass is very green the cocks should be made small. If the weather is unfavorable, its security depends upon the neat and tidy manner in which the cocks are made so as to shed rain. I seldom open and spread my hay but once from the cock; then if shaken and turned to the sun and air for a few hours it is ready for the mow or stack, and be sure to secure it without risking it out another night. Much depends upon the proper manner of putting hay in barns. I fill up my hay mow and scaffolds early in the season of haying, and do not allow it to be trampled down by the mower, or even

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to put his feet upon it, if it can be avoided. The hay is pitched into the mow from a stand point as even and as lightly as possible; and the *different qualities* of hay are stored in such a manner that they can readily be used for feed to any *kind of stock* when wanted. Hay is usually I think put up too dry.

Preparation for hay in the mow.—I have used for several years the following preparation for my hay: *Two parts of slacked or quick lime to one of salt.* The salt to be mixed with the lime until entirely dissolved, and the mass becomes a powder. Upon a load or ton of hay, at intervals in mowing or stacking, use from ten to fifteen quarts dusted evenly over the hay. I formerly used salt alone, but the men would often use too much, so that it was injurious to the stock. The above mixture obviates this—it corrects the acidity and sourness of the hay, and I do not recollect a sick animal since I commenced its use. Horses troubled with the heaves are greatly relieved feeding upon hay thus prepared, and I am satisfied it is a preventive of the heaves. My horses are kept in the stable the year round, well groomed, and they do far more work and wear longer than when suffered to run during the summer.

For forty years I have not put up what might be called damaged hay in any one year, to exceed three or four loads. I have fattened hundreds of sheep and cattle with little or no grain, and my stock have gained in flesh and often more in winter on hay than upon pasture in the grazing season. My stock are all housed or stalled that are designed for the shambles.

My lands are mostly suited for the plow, and such as is not, is watered by my flowing brook, so as to be kept in good condition.

21. *Irrigation.*—I have practiced irrigation to a considerable extent, and with the most satisfactory results. Its importance will justify a somewhat extended account.

The situation of the farm, and the stream flowing through it, is favorable. About twenty acres of meadow land are under this system, and I intend to bring about as much more under it. I have had it in operation for four years past. The lands irrigated were formerly the most difficult I had to keep in grass and meadow, it being mostly the *gravel loam* soil of the farm, and required constant applications of manure, and plowing every three or four years was resorted to, to keep it in

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tolerable condition. I now take a heavy crop of the best quality of fine early made hay, without any return of manure whatever but the simple water of the stream.

I close these grounds from my stock the first of April; they are then ready to mow early in June, and will be ready a few days after mowing for pasturage, and will carry more stock *at grazing* than any other lands on the farm. In the most gravelly portions the increase of the value for grass is more than five hundred fold, and the whole of it I consider has more than doubled, if not trebled, in intrinsic value.

The water of the brook passing through the farm is dammed so as to secure sufficient head to carry the water in ditches on each side of the stream below the dam, and it is spread from the main conduits over the land, and remains on as long as is deemed necessary, and then shut off. I can put the water when I please upon almost every square rod of the twenty acres. I flow the grounds at intervals at all seasons of the year, except when the grass is becoming ready for mowing, the intervals are longer. When the stream is up to high water, and full of vegetable matter, I am especially careful to flow the grounds. The *animalculi* in the brook water are also a great source of fertility. From the bottom of my pond I take yearly some two hundred loads of vegetable sediment chiefly, and side by side on my wheat fallow with barn yard manure, well rotted, it has proved equal if not superior.

Some amendment should be made to our laws in relation to irrigation and drainage, so that one man should not be at liberty to arrest improvements desired by others, by refusing his lands when just compensation is offered.

22. Bog and peat land has been referred to previously. I have no doubt that muck land of this character, by drainage, may be made the best natural meadow, and it may be used for corn and root crops often to very good advantage, and should not be suffered to lay waste.

23. *Weeds.*—The johnswort, daisy and sorrel, if called weeds, have mostly been eradicated. I give attention to them whenever they appear, by frequent bleeding or cutting in the milky state, and they are soon destroyed. The irrigation has destroyed them that were formerly very prevalent. I do not allow any weed to grow *ripened seed* on the farm, and particular care is taken to eradicate weeds from the walls and fences. The weed, called dogweed here with us, is troublesome; the

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seed is scattered by the birds probably. I cut it often, pull it up by the roots, or put salt upon it when salting my flock in the fields. It requires constant attention to subdue it.

24. *Domestic Animals.*—For many years the stock of my farm was that of the improved breeds: Bakewells, Cotswolds, Leicester and Lincolns. They were kept with much care, and paid well. In 1845-6, when the great depression of this stock came, I disposed of my sheep, and turned my attention to milk for the New-York market. Usually got from three to four and a half cents per quart, freight deducted. Average quantity of milk from cows (forty to fifty head) ten to twelve quarts per day during milking season. This was discontinued last spring, and I am now engaged in fattening cattle. Had forty head on 1st of April, and they will all be disposed of by 1st January.

Besides these I have working oxen, horses, and a few milch cows. My experience is, that I can fat a bullock upon less feed than I can keep a milch cow up to a full measure of milk. Although not a breeder now, I have had considerable experience in blooded stock, and testing their value for fattening purposes.

The grades I have had more frequently, and do not hesitate to say, that they will give you more growth and fat, in a given time, than the common stock of our country. I have never had much experience with the Devon and Durham, but I have seen no finer cattle for the shambles than the Hereford cattle. I have tried the Ayrshire breed for four years, and they produce almost without exception good or superior milkers, and this is their great quality.

26. My cattle are all housed. I have done with the out-door system long ago. Stalls for stock should be well ventilated, kept clean and free from offence as possible. Unless the weather is very severe I give my cattle a range in the open yards or fields, for air and exercise, a portion of the day.

27. Butter is made for family use.

28–9. I have said that I now keep no sheep, but I will give something of my views in regard to them. I would state that the price of mutton in the New-York market has ranged much higher for the last four or five years than when I kept sheep. I know that early lambs from this section bring from three to six dollars per head. I always found the sheep culture a remunerative business; but they are animals, in order to have them

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pay well, that require a great deal of nice care and attention, both as respects their food and management; and unless they can have this, I have always doubted the practicability of the farmer to keep them. In my time of keeping sheep I never gave them much grain, but considerable of vegetables. The right sort of early mown hay was my great reliance to carry them through the winter and finish them up fit for the butcher and to bring forth their young. Here again I would press the importance to the farmer to look well to his hay crop and grasses. It is the only foundation for the right and proper culture of his domestic animals that chew the cud. Brood ewes, as they are coming forward to cast their young, should be selected from the stock some ten or twelve days previous, and have a feed of grain; a proportion of oats or buckwheat should be given, with corn, and your choicest succulent hay, to bring them into milk, and strengthen them that they may bring forth their young and sustain them. With a hundred ewes, or more, it was seldom that one that had come into milk, although she might have lost her lamb, when out to pasture was without one by her side.

If a ewe lost her lamb I confined her separately, and gave her perhaps a twin lamb from another ewe, that did not get suck enough, and in a few days at most she would adopt it as her own. A striking fact about this is, that when such ewe comes to own another's lamb, she is more than usually fond of it, and makes the better nurse.

30. *Swine.*—I design only to make my own family pork. I get the best breed convenient, and kill my pigs at about seven or eight months old, and they generally weigh, at this age, about 250 pounds.

31. In regard to root crops I have not experimented to know their relative value to Indian corn fed to animals. For a number of years past I have raised about a quarter of an acre of carrots, and fed them chiefly to my work horses once in the day, and oats or corn once. I would rather have the carrots fed once than the grain fed twice per day without them.

When I kept sheep I raised considerable of the rutabaga and common turnip for them. I have, however, the present year, and very recently, had an opportunity to test the value of the rutabaga turnip in feeding my fat cattle. I have had some twenty oxen and steers in the stalls, just taken from grazing,

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I fed the turnip once in the day, and soft corn in the ear once, until all my turnips were out; after this I fed corn ground with the cob, and potatoes and carrots, a feed of each per day. After I had fed all the carrots and potatoes that I could spare for this purpose, I gave the cob meal twice usually, or increased the feed on meal to one feed. The result of this kind of feeding has been most evident in favor of the time during which the rutabaga was fed. It has been most clearly seen that my cattle did not, before nor after giving this feed, fat, nor look near as fine as then.

From my experience the present year I am satisfied in the future to cultivate quite largely rutabagas, to feed and fat cattle in winter. I prefer the carrot for milch cows. I have used carrots cooked for hogs and poultry, with great saving of corn in winter.

32 to 36. *Fruit.*—We have fruit of most kinds and of improved varieties for family use. I have found a strong decoction of potash, the best wash for the bodies and larger branches of fruit trees, and the worms are by this also destroyed.

37. *Buildings.*—My barns and other buildings were built at an early day, and were convenient for the uses designed. I have abundance of stable and other room now for the uses of the farm, with apparatus for cutting forage for stock, and steam apparatus, which is a very great saving in preparing food.

38. *Fences.*—Fences are all of stone. They were thus built to free the land from stone, and they answer the purposes well, though expensive when erected.

39 to 42. I have not given sufficient attention to the farm accounts and register of my farming operations. The most important items, cost of stock and price when sold, &c., are taken down. I am satisfied that it would be advantageous to keep correct accounts of all the farm operations. I cannot therefore give full and accurate accounts of the receipts and expenditures of my farm. The annexed are estimates mainly and believed to be substantially correct.

LEONARD D. CLIFT.

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Leonard D. Cliff—Estimates of Farm.

One hundred tons of hay, $15,		$1,500 00
Sixteen fat cattle at $100 per head,		1,600 00
Fourteen fat cattle at $90 "		1,260 00
Four veal calves at $11 "		44 00
Five Ayrshire heifers and calves, own raising,		285 00
Twenty-one cwt. pork, $9.50,		199 50
Four store pigs,		10 00
Five fat steers sold in July last, $80,		400 00
		$5,298 50
One and a half acres buckwheat, 55 bush., at 6s.,	$41 25	
Nine acres corn, 455 bush., 6s.,	341 21	
Four acres oats, 200 bush., 4s.,	100 00	
Three acres rye, 75 bush., 10s.,	93 75	
Potatoes, 50 bush., 6s.,	36 25	
Half acre of carrots, 195 bush., 3s,	73 12	
Rutabagas, 100 bush., 2s.,	25 00	
		710 58
Apples sold, cider for domestic use,	$100 00	
Corn stalks for fodder, worth	75 00	
Poultry sold,	50 00	
Tenant house, rent,	50 00	
Butter sold from five cows, besides family use,	60 00	
		335 00
		$6,344 08

Expenses of Farm.

Twelve steers, at $80 per head,	$960 00
Ten farrow cows, $27 "	270 00
Three farrow cows,	110 00
Two oxen,	150 00
"	150 00
"	145 00
One Durham steer,	75 00
One Durham heifer,	50 00

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Two heifers,		62 00
Ten steers, $47.50,		475 00
One steer,		40 00
First cost stock,		$2,487 00
I employ two men the whole year.		
One man at	$200 00	
"	125 00	
Extra help at hay and harvest,	100 00	
Other labor from time to time,	70 00	
Total expense labor,		495 00
		2,982 00
Cost of board of servants,		300 00
Total expenses of farm,		$3,282 00
Produce of the farm,		$6,344 08
Expenses of the farm,		3,282 00
Balance,		$3,062 08

NOTE. No charge being made for blacksmith bills, repairs of implements, for personal services, or taxes.

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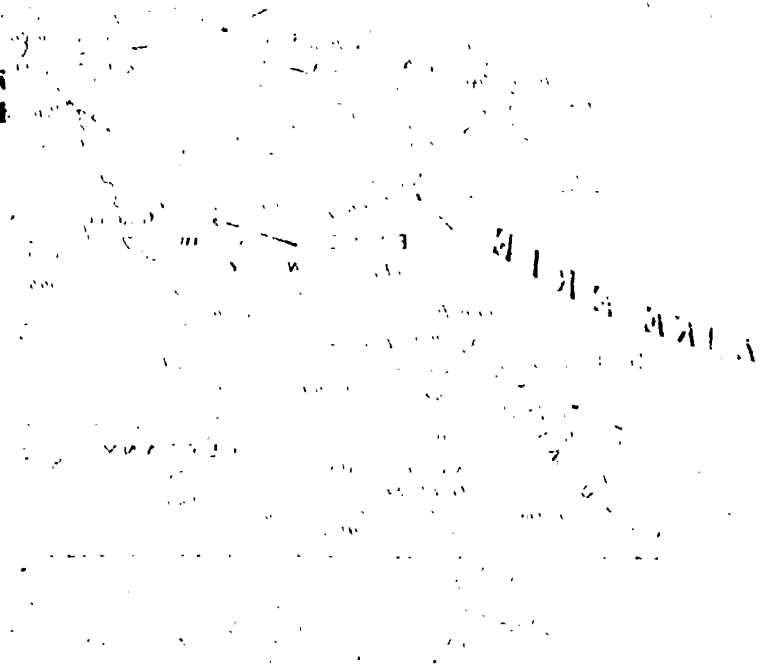

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ESSAY

ON THE

CLIMATE OF THE STATE OF NEW-YORK.

BY FRANKLIN B. HOUGH.

The completion of a summary of meteorological records, made at sixty-two different academies in this State during a quarter of a century, under the direction of the Regents of the University,* has afforded the opportunity of presenting the practical results of this extensive and long-continued system of observations, and of drawing therefrom a series of generalizations with reference to its bearing upon the operations of agriculture and the useful arts.

The application of meteorological science to the explanation of its influences upon vegetable and animal life, and the strict dependance of the husbandman upon the genial return of the seasons, and auspicious succession of cold and heat, of sunshine and showers, for the fulfilment of his hopes, has long been recognized, and every discovery in the laws which govern our climate is to him an important acquisition. Although we may not be able to modify, or in the slightest degree vary these changes, yet by a careful comparison of observations, made at many stations, through long periods, we may arrive at a knowledge of this probable succession in the future; be able, in some instances, to foretel disastrous changes in time to prepare for them, and so to plan our operations as to secure the greatest advantages attainable.

* "Results of a series of Meteorological Observations made in obedience to instructions from the Regents of the University, at sundry academies in the State of New-York, from 1825 to 1850 inclusive. Compiled from the original returns, and the annual reports of the Regents of the University. By Franklin B. Hough, A. M., M. D., Corresponding Member of the New-York Historical Society. Published by Legislative Authority. Albany: Weed, Parsons & Co., Printers, 1855." 4to. pp. 562, with map and diagrams.

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From necessity, spending much of his time in the open air, and an interested observer of atmospheric changes, the farmer seems peculiarly favored for the study of meteorology, and a concerted and intelligent course of observation by agriculturists throughout the State, would add much to our knowledge of the general features and local variations of our climate. Such a plan has been recommended by the State Agricultural Society to its members, and merits the most careful attention.

The accompanying map exhibits the location of the several stations at which observations were made during the period embraced in the series under consideration, the arrows at each indicating by their direction the prevailing course, and by their length the relative amount of winds at each. The head of the arrows represents the place of the station.

The observations made at academies, as above mentioned, consisted of a record of the thermometer thrice daily; of the wind and aspect of the sky in the forenoon and afternoon, and of the depth of rain and snow, with notices of haloes, auroras and meteors, the progess of vegetation, the arrival and departure of birds of passage, unusual atmospheric phenomena, and such other memoranda as might serve to mark the relative forwardness of the seasons, or preserve some interesting fact in physical science. The temperature was directed to be noted in the morning before sunrise, for the coldest period in the day, between two and four o'clock in the afternoon, for the warmest, and an hour after sunset. The mean was obtained, by adding to the morning observation twice the afternoon and twice the evening observation with that of the next morning, and dividing their sum by 6.*

The thermometers first supplied to academies were made by Mr. Kendall, of New Lebanon, and the graduation was that of Fahrenheit. They were directed to be placed in a situation where there was a free circulation of air, and screened from the direct or reflected rays of the sun, and as far as practicable from the radiations of neighboring bodies.

Twice during each day the temperature is that of the mean, and a single observation then made would give this element; but these periods are found to vary greatly, and to occur at a time

* The arithmetical mean of the daily observations, and the mean obtained by the above rule, were both given for the Albany station during four years, by the late Dr. T. Romeyn Beck, with the view of arriving at the comparative accuracy of the two methods. The result showed that the rule adopted gave about one-third of a degree higher than the other.

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when the temperature is changing most rapidly. The periods of daily maximum and minimum are most constant, but are still very liable to be influenced by direction of the wind and aspect of sky. They generally occur earlier in winter than in summer, and in climates where sea breezes prevail, the greatest heat often occurs before noon.

The State of New-York, extending over a hundred miles along the sea coast, and stretching to the great lakes, presenting every variety of surface, from alpine peaks to level sandy plains, exposed to the breezes of the Atlantic and the chilling but bracing winds of the north, may be supposed to present all the modifications of climate which these varied circumstances can produce. Hence we observe that the mean temperatures of stations where observations have been made, vary from 42 to 51 degrees, with an extreme range of 145 degrees; the mean direction of the wind, from a point N. 54 W. to S 84 degrees E., through every intermediate point of west and south; the force of the wind, from 3 to 59 per cent, and the mean annual depth of rain from 22 to 46 inches.

The blossoming of plants, and other harbingers of spring, occur from two to three weeks earlier on Long Island, than in the northern and western parts of the State, while in the latter, the first frosts and snows indicating the approach of winter, are seen nearly a month sooner. The progress of vegetation in midsummer, as indicated by the harvests, is found to vary but little, thus indicating the more rapid progress of vegetation in the colder sections of the State, and an approach to the short and hot summers of polar climates. It is noticed, that the first appearance of birds of passage in the southern and northern parts of the State, is much more uniform than the flowering of plants, the extreme interval of first appearance seldom exceeding a week.

As the earth is enveloped by the atmosphere, which is highly elastic, and easily displaced by slight changes of temperature, and as it is influenced both by astronomical and local causes, it is obvious, that we must go beyond the limits of a State, in the investigation of its general laws, and take into account the influences of oceans and lakes, of arid sands, woodlands and mountains, vallies and plains, in their unequal capacity for absorbing or reflecting solar heat, affording moisture by evaporation, or modifying the direction and velocity of winds. Were the earth's surface *uniform*, it is probable

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that changes in the atmosphere would occur with the same regularity as day and night, and hence, it becomes highly important, to study the modifying effects of local causes, and take into account their influences in producing permanent or occasional conditions of climate.

Altitude, is found to exert a much greater influence, other circumstances being equal, than geographical position; and it is a familiar fact, that in mountainous regions under the same parallel within the tropics, one can meet with every vicissitude of climate that is known. The temperature diminishing as we ascend, at an elevation of a few thousand feet in our latitude, in summer, reaches the point of congelation, which is constantly fluctuating with the seasons, and the alternations of day and night; often descending to the earth's surface in winter, and making its monthly and almost weekly visits to the peaks of our mountains throughout the year.

The direction of winds, and other causes, so essentially vary the decrease of temperature in highlands, that no definite rule can be given for determining it, but the results of observations in this State, show a striking difference of mean temperature, between places similarly situated except in altitude, which can be ascribed to no other cause. A comparison of Onondaga and Pompey; of Utica or Whitesboro, and Bridegwater, Hamilton or Fairfield; of Newburgh and Goshen, or of Poughkeepsie and Amenia, in the accompanying tables, will illustrate this point. It will also be noticed, that all the stations on Long Island, and in the valley of the Hudson as far as Lansingburgh, have a mean temperature above that of the State, while with eight exceptions,* those situated in the central, western, and northern sections, have a mean below the general average.

Extremes of temperature become *less*, as the mean is *higher;* the annual extremes of seventeen stations which were less than 100 degrees, having with a single exception, a mean above that of the whole State. Of twenty-two stations at which the mean annual range is below that of the State, all but one, are in the vicinity of lakes or large rivers.

The temperature of the months, is observed to increase from the first half of February, to the last half of July, the mean of the second half of April and of October, being nearly that of

* Cayuga, Prattsburgh, Fredonia, Lewiston, Mexico, Onondaga, Rochester and Syracuse. Most of these are in the vicinity of lakes or other bodies of water which exert an equalizing effect upon the country around them.

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the year. The distribution of heat through the several months, is shown by the following table, which embraces the entire period and all the stations reporting:

Months.	1st half.	2d half.	Whole month.
January,	25°.17	24°.19	24°.68
February,	21 .68	26 .59	24 .11
March,	31 .02	35 .86	33 .44
April,	43 .05	47 .58	45 .30
May,	53 .37	59 .06	56 .21
June,	63 .71	67 .49	65 .60
July,	69 .12	70 .23	69 .67
August,	69 .94	66 .99	68 .46
September,	62 .14	57 .60	59 .87
October,	50 .49	46 .05	48 .27
November,	41 .24	34 .11	37 .67
December,	29 .19	25 .30	27 .24

The station having the highest annual mean was Erasmus Hall, (Flatbush,) and that having the greatest range of temperature was Gouverneur.

The results of temperature throughout the State, are shown by the following table, which also exhibits a complete list of the stations, their location, elevation above tide, and the number of years in which the thermometer was observed. The aggregate period observed was 773 years.

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TABLE *showing the names and locations of Academies at which observations were made, with their elevation above tide, period of observation and temperature.*

ACADEMIES AND THEIR LOCATION.	Elevations above tide.	No. of years observed.	THERMOMETER.					
			Mean temperature.	Highest degree.	Lowest degree.	Extreme range.	MEAN RANGE.	
							Monthly.	Annual.
	Feet.							
Albany—Albany county,	130	24	48°.60	97°	—23°	120°	67°.5	100°
Amenia Seminary—Dutchess county,	540	1	46 .73	96	—16	112	45 .5	112
Auburn—Cayuga county,	650	22	46 .62	96	—14	110	68	96
Bridgewater—Oneida county,	1,286	4	42 .66	94	—31	125	70 .5	112
Buffalo—Erie county,	623	2	46 .14	92	—22	114	55 .5	114
Cambridge—Washington county,	.....	14	45 .39	98	—36	134	74 .2	116
Canajoharie—Montgomery county,	284	3	45 .77	97	—36	133	62	118
Canandaigua—Ontario county,	707	10	45 .73	94	—11	105	62	96
Cayuga—(Aurora) Cayuga county,	447	13	49 .16	96	—10	106	63 .2	94
Cherry Valley—Otsego county	1,335	15	44 .27	98	—30	128	73	105
Clinton—(E. Hampton) Suffolk county,	16	17	48 .74	95	— 8	103	61 .5	88
Cortland—(Homer) Cortland county,	1,096	18	44 .67	95	—28	123	71 .5	105
Delaware—(Delhi) Delaware county,	1,384	2	46 .66	93	—17	110	59	110
Dutchess—(Poughkeepsie) Dutchess county,	.....	16	50 .61	102	—22	124	73	106
Erasmus Hall—(Flatbush) Kings county,	40	24	51 .62	96	— 4	100	59 .5	87
Fairfield—Herkimer county,	1,185	19	43 .26	96	—26	122	72 .3	105
Farmers' Hall—(Goshen) Orange county,	425	11	47 .56	98	—30	128	69 .8	102
Franklin—(Malone) Franklin county,	703	3	43 .54	94	—24	118	65	109
Franklin—(Prattsburgh) Steuben county,	1,494	10	49 .43	100	—19	119	71	106
Fredonia—Chautauque County,	728	18	48 .38	97	—12	109	65 .8	93
Gaines—Orleans county,	426	4	46 .71	94	— 7	101	57 .5	94
Gouverneur—St. Lawrence county,	400	12	43 .95	100	—40	140	79 .8	123
Granville—Washington county,	.....	14	45 .39	102	—31	133	74 .5	117

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List of stations and their results of temperature throughout the State.—(CONTINUED.)

ACADEMIES AND THEIR LOCATION.	Elevations above tide.	No. of years observed.	THERMOMETE				MEAN RANGE.	
			Mean temperature.	Highest degree.	Lowest degree.	Extreme range	Monthly.	Annual.
	Feet.							
Greenville—Greene county,	.....	1	48°.05	91°	—17°	108°	51 .5	108
Hamilton—Madison county,	1,127	17	44 .82	96	—34	130	77 .5	112
Hartwick—Otsego county,	1,100	16	46 .54	96	—30	126	71	104
Hudson—Columbia county,	150	17	47 .84	99	—24	123	67 .8	102
Ithaca—Tompkins county,	417	17	48 .38	98	—18	116	70 .5	101
Johnstown—Fulton county,	688	14	44 .91	96	—30	126	72 .3	112
Kinderhook—Columbia county,	126	17	47 .00	102	—30	134	74 .5	109
Kingston—Ulster county,	188	19	49 .57	100	—30	130	71	104
Lansingburgh—Rensselaer, county,	30	20	47 .92	101	—28	129	74	114
Lewiston—Niagara county,	280	17	47 .88	97	— 6	103	65 .3	92
Lowville—Lewis county,	800	19	43 .62	100	—40	140	79	120
Mexico—Oswego county,	331	11	49 .08	99	—24	123	72	106
Middlebury—Wyoming county,	800	19	46 .78	100	—20	120	78	103
Millville—Orleans county,	.....	8	46 .11	95	—12	107	65	99
Monroe—(Henrietta) Monroe county,	600	3	45 .84	96	— 9	105	60	97
Montgomery—Orange county,	.....	13	48 .60	104	—33	137	77 .5	109
Mount Pleasant—Westchester county,	125	12	47 .41	97	— 8	105	58 .5	93
Newburgh—Orange county,	150	18	97 .67	105	—15	120	69	100
New-York Institute Deaf and Dumb,	50	6	51 .01	92	— 2	94	49	84
North Salem—Westchester county,	361	19	48 .06	102	—31	133	74	105
Ogdensburgh—St. Lawrence county,	280	1	43 .48	92	—10	102	44	102
Oneida Conference Seminary—(Cazenovia) Madison county,	260	19	43 .65	97	—28	125	74	109
Oneida Institute—(Whitesboro') Oneida county,	405	7	44 .83	98	—33	131	71 .8	115
Onondaga—(Onondaga Hollow) Onondaga county,	600	16	47 .18	99	—22	121	72 .8	106
Oxford—Chenango county,	961	16	44 .74	98	—36	134	76 .3	114

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Oyster Bay—Queens county,	.....	2	50 .81	95	— 3	92	48 .2	90
Palmyra—Wayne county,	.....	1	45 .33	93	— 9	102	54	102
Plattsburgh—Clinton county,	120	5	45 .17	100	—20	120	63	108
Pompey—Onondaga county,	1,300	17	42 .83	91	—18	109	66	99
Redhook—Dutchess county,	.....	12	48 .36	98	—28	126	68	102
Rochester—Monroe county,	506	19	46 .79	102	— 9	111	67	95
St. Lawrence—(Potsdam) St. Lawrence county,	594	31	43 .61	96	—34	130	78 .3	114
Schenectady—Schenectady county,	.....	3	45 .82	91	—16	107	55 .3	101
Springville—Erie county,	1,082	7	45 .32	95	—20	115	69 .2	102
Syracuse—Onondaga county,	400	1	47 .30	94	— 3	97	45	97
Union Hall—(Jamaica) Queens county,	.....	25	49 .87	100	— 7	107	64 .2	92
Union Literary Society—(Bellville) Jefferson county,	400	9	45 .51	98	—35	133	74 .5	112
Utica—Oneida county,	471	22	45 .38	97	—27	124	75	104
Washington—(Salem) Washington county,	.....	10	46 .53	100	—40	140	73 .8	119
Mean,	.....	.....	46°.74	.....	.....		67°	103

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TABLE *showing the Temperature at each station by months.*

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Albany,	24°.37	24°.72	35°.03	47°.74	60°.06	68°.12	72°.24	70°.17	61°.38	49°.48	37°.16	28°.40
Amenia,	21 .79	20 .12	35 .56	41 .54	56 .67	66 .55	69 .34	67 .86	57 .76	46 .99	45 .15	28 .24
Auburn,	24 .37	24 .63	33 .47	45 .26	54 .39	63 .56	69 .84	68 .18	59 .44	48 .22	47 .75	29 .54
Bridgewater,	20 .64	21 .87	29 .88	42 .29	52 .98	69 .58	66 .63	62 .90	55 .44	44 .66	31 .42	23 .67
Buffalo,	23 .43	21 .13	35 .48	40 .70	55 .28	67 .44	61 .54	69 .98	64 .39	48 .75	37 .21	22 .84
Cambridge,	22 .44	21 .45	32 .69	44 .19	55 .27	64 .82	68 .88	66 .09	58 .29	46 .76	36 .56	28 .51
Canajoharie,	20 .97	19 .61	30 .46	47 .29	58 .33	64 .06	70 .34	67 .36	58 .69	49 .06	37 .87	25 .26
Canandaigua,	23 .34	21 .09	31 .84	45 .94	55 .92	65 .70	69 .48	66 .81	57 .32	47 .85	36 .14	26 .68
Cayuga,	28 .69	28 .18	36 .91	46 .59	56 .55	66 .15	72 .27	70 .71	62 .96	50 .52	40 .52	29 .80
Cherry Valley,	22 .03	21 .66	30 .30	43 .64	53 .84	63 .47	67 .01	65 .58	57 .82	45 .80	39 .36	35 .34
Clinton,	30 .13	30 .75	36 .36	44 .43	53 .18	62 .79	69 .68	68 .51	62 .54	52 .19	41 .27	33 .45
Cortland,	23 .87	22 .43	31 .17	43 .15	54 .03	62 .07	66 .18	64 .74	57 .28	46 .02	36 .16	26 .70
Delaware,	24 .43	30 .05	34 .80	39 .93	55 .74	70 .31	69 .77	65 .14	56 .02	44 .76	38 .19	30 .84
Dutchess,	26 .67	26 .40	36 .25	50 .12	59 .88	68 .19	73 .87	72 .10	63 .92	51 .97	41 .33	30 .00
Erasmus Hall,	31 .49	31 .37	40 .16	49 .14	50 .55	67 .36	72 .68	71 .40	64 .28	53 .47	44 .15	35 .16
Fairfield,	19 .86	20 .44	29 .58	41 .72	53 .53	62 .54	66 .07	65 .64	57 .82	45 .94	34 .19	23 .04
Farmers' Hall,	25 .65	26 .31	36 .54	47 .41	56 .22	64 .73	68 .69	67 .64	57 .76	48 .44	38 .78	28 .01
Franklin, M.,	18 .24	26 .14	31 .42	36 .54	47 .41	56 .22	64 .73	65 .44	55 .17	46 .91	32 .85	31 .22
Franklin, P.,	24 .47	24 .21	32 .99	46 .79	45 .07	53 .00	60 .22	65 .88	57 .54	45 .93	35 .21	28 .22
Fredonia,	28 .66	27 .41	35 .32	46 .45	56 .64	65 .36	70 .86	68 .81	61 .27	50 .55	41 .24	30 .82
Gaines,	25 .36	28 .38	34 .46	46 .54	54 .48	62 .99	71 .76	66 .38	59 .83	47 .69	35 .25	28 .45
Gouverneur,	19 .74	18 .64	30 .93	44 .53	54 .89	63 .59	68 .86	67 .23	58 .18	47 .02	33 .79	19 .97
Granville,	20 .67	20 .09	31 .29	43 .63	56 .15	66 .49	70 .82	68 .35	58 .72	47 .70	35 .81	24 .79
Greenville,	30 .27	27 .93	33 .77	40 .18	62 .51	66 .77	68 .87	68 .72	61 .23	51 .26	36 .96	33 .13
Hamilton,	22 .90	22 .95	31 .80	45 .43	54 .97	63 .08	67 .36	65 .86	58 .28	45 .88	35 .63	26 .35
Hartwick,	24 .23	25 .22	38 .89	44 .42	56 .47	65 .07	68 .25	66 .72	58 .75	48 .46	38 .61	26 .94
Hudson,	25 .02	25 .74	34 .89	47 .46	58 .87	67 .53	71 .45	71 .31	61 .56	49 .82	38 .67	27 .93
Ithaca,	28 .14	27 .04	34 .62	46 .98	57 .52	65 .13	70 .59	68 .64	60 .32	48 .69	39 .03	30 .69
Johnstown,	21 .28	22 .11	31 .50	43 .08	55 .66	65 .16	69 .00	67 .80	58 .24	46 .59	34 .39	23 .61
Kinderhook,	22 .89	23 .33	33 .74	46 .29	57 .26	65 .44	70 .15	68 .47	60 .30	47 .54	38 .38	25 .30

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Kingston,	27 .34	26 .65	35 .09	49 .37	58 .52	58 .90	75 .21	70 .90	62 .01	50 .67	41 .09	30 .51
Lansingburgh,	22 .75	24 .56	34 .18	47 .60	59 .15	67 .84	71 .75	70 .20	61 .83	49 .65	38 .56	27 .12
Lewiston,	27 .23	26 .92	34 .80	46 .32	56 .73	64 .73	71 .25	69 .56	61 .79	49 .74	39 .11	29 .74
Lowville,	20 .11	28 .68	29 .67	44 .28	54 .15	62 .98	67 .41	65 .23	57 .17	45 .87	34 .09	23 .83
Mexico,	22 .68	22 .16	31 .12	42 .29	51 .91	62 .72	66 .48	65 .69	58 .47	44 .04	34 .61	25 .44
Middlebury,	26 .27	26 .29	33 .96	45 .58	56 .10	63 .89	68 .75	66 .91	59 .14	48 .00	37 .21	29 .17
Millville,	26 .00	26 .36	32 .28	45 .55	54 .68	63 .23	68 .24	67 .73	59 .50	46 .62	37 .75	28 .99
Monroe,	26 .85	22 .72	36 .98	48 .51	57 .17	64 .72	68 .21	63 .87	57 .91	49 .58	33 .40	26 .89
Montgomery,	25 .36	27 .02	36 .63	47 .63	58 .36	65 .99	72 .34	70 .31	62 .51	49 .23	39 .47	29 .03
Mount Pleasant,	27 .96	29 .38	38 .03	48 .34	57 .87	67 .68	71 .21	71 .12	62 .49	50 .63	40 .19	30 .25
Newburg,	27 .81	26 .88	35 .96	48 .19	59 .13	67 .76	72 .25	70 .95	63 .33	51 .83	40 .83	29 .84
New-York,	31 .76	29 .45	37 .28	97 .93	57 .68	68 .07	73 .10	71 .50	63 .94	52 .19	44 .31	34 .95
North Salem,	27 .13	25 .71	35 .81	46 .68	56 .96	66 .02	71 .25	69 .39	60 .71	49 .21	39 .45	28 .92
Ogdensburgh,	24 .75	12 .33	32 .94	39 .81	52 .54	66 .53	71 .66	68 .31	59 .22	44 .58	29 .74	19 .43
Oneida Conference,	21 .58	21 .16	30 .33	43 .33	53 .33	61 .68	66 .47	64 .88	57 .48	47 .63	35 .15	24 .19
Oneida Institute,	19 .68	20 .85	29 .08	43 .74	56 .48	64 .53	71 .41	65 .99	58 .50	47 .09	34 .57	23 .97
Onondaga,	25 .28	25 .66	33 .81	45 .96	58 .01	65 .49	68 .90	68 .05	59 .75	48 .26	36 .54	29 .12
Oxford,	22 .24	22 .24	31 .66	44 .79	55 .26	63 .44	68 .08	66 .02	57 .70	45 .73	34 .80	24 .88
Oyster Bay,	27 .48	35 .11	38 .94	49 .31	57 .58	67 .17	72 .57	70 .30	64 .02	54 .00	43 .26	33 .96
Palmyra,	25 .93	20 .37	30 .68	49 .84	56 .20	64 .46	67 .96	64 .00	54 .39	54 .39	51 .78	39 .82
Plattsburgh,	21 .67	19 .91	30 .66	40 .45	56 .13	65 .31	69 .43	68 .86	59 .55	46 .34	39 .51	26 .38
Pompey,	20 .94	20 .72	29 .78	41 .05	52 .50	61 .71	65 .97	64 .29	55 .19	44 .65	32 .47	23 .85
Redhook,	24 .66	26 .06	35 .83	49 .13	58 .00	67 .02	71 .88	68 .64	61 .61	50 .41	39 .58	27 .58
Rochester,	26 .25	25 .92	32 .90	45 .57	56 .05	64 .62	69 .76	67 .71	60 .11	47 .83	38 .39	28 .62
St. Lawrence,	18 .41	18 .78	29 .98	43 .75	55 .02	63 .97	68 .39	66 .74	57 .37	44 .99	33 .72	22 .11
Schenectady,	21 .74	19 .94	28 .88	44 .74	58 .15	66 .62	68 .77	66 .86	59 .82	46 .78	37 .45	29 .19
Springville,	24 .88	25 .95	30 .75	45 .45	53 .14	61 .62	67 .51	64 .18	57 .62	46 .23	37 .49	28 .13
Syracuse,	30 .90	20 .56	26 .14	45 .51	58 .30	66 .66	71 .24	71 .49	64 .28	47 .72	32 .80	32 .12
Union Hall,	29 .44	29 .34	37 .63	47 .24	56 .96	64 .91	71 .23	70 .58	61 .99	51 .85	41 .72	32 .51
Union, L. S,	23 .73	22 .91	32 .64	48 .18	56 .50	64 .68	69 .59	66 .13	60 .04	48 .98	37 .77	25 .93
Utica,	23 .27	23 .35	32 .28	44 .71	56 .45	64 .22	68 .55	66 .74	58 .43	47 .38	36 .23	26 .79
Washington,	22 .43	22 .75	32 .57	45 .65	57 .03	65 .94	69 .29	69 .55	60 .06	46 .63	38 .55	28 .31
Mean,	24°.68	24°.11	33°.44	45°.30	56°.21	65°.60	69°.67	68°.46	59°.87	48°.27	37°.67	27°.24

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TABLE *showing the progress of the seasons, as indicated by the first frost in autumn, and the first fall of snow.*

STATIONS.	FIRST ANTUMNAL FROST.				FIRST FALL OF SNOW.			
	Years reporting	Earliest date.	Latest date.	Mean date.	Years reporting	Earliest date.	Latest date.	Mean date.
Albany,	19	Sept. 9,	Oct. 28,	Oct. 7,	22	Oct. 13,	Nov. 29,	Nov. 11.
Amenia,	1	Oct. 9,	Oct. 9,	Oct. 9,	1	Oct. 30,	Oct. 30,	Oct. 30.
Auburn,	20	Aug. 5,	Oct. 27,	Oct. 1,	10	Sept. 27,	Dec. 17,	Oct. 30.
Bridgewater,	4	Aug. 4,	Sept. 30,	Sept. 3,	4	Oct. 13,	Nov. 12,	Oct. 25.
Cambridge,	8	Aug. 24,	Oct. 25,	Sept. 24,	13	Oct. 12,	Nov. 23,	Nov. 7.
Canajoharie,	1	Sept. 18,	Sect. 18,	Sept. 18,	3	Oct. 20,	Nov. 30,	Nov. 11.
Canandaigua,	9	Sept. 6,	Oct. 14,	Sept. 23,	10	Sept. 25,	Nov. 29,	Nov. 5.
Cayuga,	11	Sept. 18,	Oct. 28,	Oct. 14,	11	Oct. 15,	Nov. 24,	Nov. 3.
Cherry Valley,	12	Aug. 21,	Oct. 7,	Sept. 19,	13	Sept. 20,	Nov. 14,	Oct. 25.
Clinton,	15	Sept. 28,	Nov. 27,	Oct. 23,	16	Nov. 7,	Dec. 29,	Dec. 3.
Cortland,	17	Aug. 4,	Oct. 16,	Sept. 14,	17	Sept. 23,	Nov. 11,	Oct. 19.
Dutchess,	14	Sept. 10,	Oct. 16,	Oct. 1,	16	Oct. 12,	Dec. 17,	Nov. 19.
Erasmus Hall,	24	Sept. 13,	Oct. 26,	Oct. 4,	23	Oct. 30,	Dec. 17,	Nov. 22.
Fairfield,	18	Aug. 29,	Oct. 12,	Sept. 13,	17	Sept. 28,	Nov. 15,	Oct. 18.
Farmers' Hall,	9	Sept. 2,	Oct. 12,	Sept. 28,	11	Nov. 16,	Dec. 17,	Nov. 30.
Franklin, (M.),	3	Aug. 29,	Sept. 12,	Sept. 7,	3	Sept. 22,	Oct. 25,	Oct. 5.
Franklin, (P.),	10	Sept. 9,	Oct. 16,	Sept. 26,	1	Sept. 29,	Nov. 30,	Nov. 7.
Fredonia,	16	Aug. 29,	Oct. 25,	Sept. 28,	17	Oct. 14,	Dec. 4,	Nov. 1.
Gaines,	4	Sept. 12,	Oct. 6,	Sept. 25,	4	Sept. 27,	Nov. 9,	Oct. 22.
Gouverneur,	12	Aug. 25,	Oct. 1,	Sept. 12,	12	Sept. 27,	Nov. 18,	Oct. 26.
Granville,	12	Sept 12,	Oct. 26,	Sept. 26,	14	Oct. 12,	Dec. 5,	Nov. 7.
Hamilton,	15	Aug. 3,	Oct. 13,	Sept. 11,	15	Sept. 22,	Nov. 12,	Oct. 15.
Hartwick,	13	Aug. 4,	Oct. 21,	Sept. 21,	13	Sept. 28,	Nov. 15,	Nov. 4.
Johnstown,	13	Sept. 2,	Oct. 12,	Sept. 19,	14	Oct. 12,	Nov. 16,	Nov. 10.
Kinderhook,	16	Sept. 1,	Oct. 9,	Sept. 22,	17	Oct. 18,	Nov. 28,	Nov. 6.
Kingston,	15	Sept. 9,	Oct. 17,	Sept. 25,	18	Oct. 12,	Dec. 15,	Nov. 19.
Lansingburgh,	17	Sept. 6,	Oct. 17,	Oct. 1,	16	Oct. 12,	Nov. 25,	Nov. 8.

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Lewiston,	17	Aug. 4,	Oct. 16,	Sept. 22,	18	Sept. 27,	Nov. 28,	Nov. 1.
Lowville,	17	Sept. 1,	Oct. 6,	Sept. 17,	19	Oct. 15,	Dec. 19,	Oct. 30.
Mexico,	11	Sept. 10,	Oct. 7,	Sept. 19,	11	Oct. 13,	Nov. 12,	Oct. 29.
Middlebury,	17	Aug. 28,	Oct. 15,	Sept. 22,	17	Sept. 30,	Nov. 29,	Nov. 6.
Millville,	8	Sept. 11,	Oct. 14,	Sept. 24,	8	Oct. 14,	Nov. 10,	Oct. 23.
Monroe,	1	Sept. 28,	Oct. 28,	Sept. 28,	3	Sept. 28,	Nov. 11,	Oct. 24.
Montgomery,	8	Aug. 30,	Nov. 3,	Sept. 22,	11	Oct. 12,	Dec. 3,	Nov. 15.
Mount Pleasant,	9	Aug. 4,	Nov. 3,	Sept. 28,	12	Oct. 23,	Dec. 18,	Nov. 18.
Newburgh,	15	Sept. 23,	Oct. 23,	Oct. 3,	18	Oct. 12,	Dec. 17,	Nov. 21.
New-York,	6	Oct. 9,	Oct. 31,	Oct. 18,	6	Nov. 17,	Dec. 2,	Nov. 23.
North Salem,	19	Aug. 4,	Oct. 11,	Sept. 18,	19	Oct. 4,	Dec. 11,	Nov. 16.
Ogdensburgh,	1	Sept. 2,	Sept. 2,	Sept. 2,	1	Oct. 13,	Oct. 13,	Oct. 13.
Oneida Conference,	19	Aug. 4,	Oct. 3,	Sept. 12,	19	Sept. 29,	Nov. 23,	Oct. 23.
Oneida Institute,	5	Aug. 4,	Oct. 4,	Sept. 9,	7	Oct. 13,	Nov. 24,	Nov. 5.
Onondaga,	15	Sept. 6,	Oct. 23,	Sept. 27,	15	Sept. 27,	Dec. 8,	Oct. 31.
Oxford,	16	Sept. 3,	Sept. 30,	Sept. 16,	16	Sept. 28,	Nov. 27,	Oct. 22.
Oyster Bay,	2	Sept. 30,	Oct. 5,	Oct. 3,	2	Nov. 14,	Nov. 16,	Nov. 15.
Plattsburgh,	5	Sept. 10,	Oct. 9,	Sept. 29,	5	Oct. 15,	Nov. 24,	Nov. 5.
Pompey,	15	Sept. 3,	Oct. 15,	Sept. 23,	16	Sept. 27,	Nov. 7,	Oct. 18.
Red Hook,	9	Sept. 13,	Oct. 29,	Oct. 5,	12	Oct. 12,	Dec. 15,	Nov 16.
Rochester,	18	Sept. 11,	Oct. 13,	Sept. 26,	18	Oct. 6,	Nov. 29,	Oct. 28.
St. Lawrence,	20	Aug. 5,	Oct. 4,	Sept. 7,	20	Sept. 27,	Nov. 26,	Nov. 2.
Schenectady,	2	Sept. 21,	Oct. 21,	Oct. 6,	3	Oct. 12,	Nov. 23,	Nov. 6.
Springville,	7	Aug. 4,	Sept. 29,	Sept. 9,	7	Sept. 27,	Nov. 11,	Oct. 22.
Union Hall,	25	Sept. 2,	Oct. 23,	Oct. 1,	24	Nov. 4,	Dec. 11,	Nov. 24.
Union, L. S.,	7	Sept. 2,	Oct. 12,	Sept. 20,	9	Oct. 5,	Nov. 27,	Nov. 4.
Utica,	21	Aug. 4,	Oct. 17,	Oct. 4,	21	Sept. 28,	Dec. 3,	Nov. 1.
Washington,	9	Sept. 8,	Oct. 1,	Sept. 18,	9	Sept. 29,	Nov. 26,	Oct. 27.
Earliest,		Aug. 4,				Sept. 27,		
Latest,			Nov. 27,				Dec. 27,	
Mean,				Sept. 24,				Nov. 4.

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TABLE *exhibiting the average results of Temperature at all the stations, for each of the years embraced in the series, with the highest and lowest degrees, and the extreme and mean range.*

YEARS.	Stations reporting.	THERMOMETER.				
		Mean.	Highest degree.	Lowest degree.	Extreme ale. rat.ge.	Mean mo.ra'ge
1826,	21	48°.71	100,° 3 statione,	—26, Hamilton,	126°	54°
1827,	30	46 .83	101, Newburgh,	—32, 2 stations,	133	49
1828,	33	49 .70	100, Montgomery,	—24, Lowville,	124	46
1829,	16	46 .54	98, 2 stations,	—28, 2 stations,	126	49
1830,	40	48 .24	104, Montgomery,	—33, Lowville,	137	49
1831,	39	47 .18	98, Montgomery,	—30, Hartwick,	128	48
1832,	38	47 .12	99 Dutchess,	—30. Gouverneur,	129	51
1833,	43	46 .88	99, Montgomery,	—31, Gouverneur,	130	50
1834,	42	47 .51	101, 2 stations,	—27, Gouverneur,	128	51
1835,	46	45 .98	98, 3 stations,	—40, 2 stations,	138	53
1836,	33	43 .96	98, Granville,	—36, Oxford,	134	51
1837,	34	45 .64	98, Montgomery,	—32, Oneida Institute,	130	50
1838,	33	45 .54	101, 2 stations,	—30, Gouverneur,	131	50
1839,	37	46 .47	98, Farmers' Hall,	—35, Lowville,	133	51
1840,	37	47 .23	102, Washington,	—32, St. Lawrence,	134	50
1841,	39	45 .69	102, North Salem,	—30, Oxford,	132	50
1842,	44	46 .71	100, 2 stations,	—24, Gouverneur,	124	50
1843,	39	44 .62	99, Lansingburgh,	—26, 2 stations,	135	48
1844,	37	46 .98	94, 2 stations,	—30, Johnstown,	124	50
1845,	35	47 .25	104, Lansingburgh,	—28, Gouverneur,	132	52
1846,	29	48 .28	101, Lansingburgh,	—25, Granville,	126	49
1847,	25	47 .29	99, 2 stations,	—26, Washington,	125	53
1848,	25	47 .60	101, Newburgh;	—30, Granville,	131	49
1849,	23	46 .95	105, 2 stations,	—24, Granville,	129	46
1850,	9	48 .67	98, Union Hall,	—22, Lansingburgh,	120	47

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TABLE *showing the mean Temperature of the several months, from* 1826 *to* 1850, *inclusive, derived from the combination of the observations of all the stations.*

	January.	Febuary.	March.	Apri	May.	Juno.	July.	August.	September	October.	November.	December.
1826,.....	27°.20	29°.02	36°.31	51°.45	65°.03	67°.93	70°.09	69°.22	61°.56	50°.63	37°.47	26°.61
1827,.....	19 .78	28 .50	35 .32	45 .26	55 .70	65 .08	70 .02	69 .18	59 .90	50 .02	33 .31	29 .95
1828,.....	30 .15	34 .99	37 .92	42 .51	58 .22	70 .66	69 .35	71 .52	60 .85	56 .86	39 .13	34 .31
1829,.....	23 .47	19 .34	30 .72	45 .72	60 .09	65 .74	67 .28	67 .82	56 .16	49 .91	36 .09	36 .32
1830,.....	21 .75	23 .91	35 .86	51 .68	55 .32	63 .03	72 .18	67 .49	58 .92	51 .34	45 .18	32 .25
1831,.....	20 .30	21 .30	35 .07	47 .90	58 .42	69 .97	70 .72	70 .67	61 .37	52 .20	38 .08	16 .17
1832,.....	24 .56	24 .53	35 .00	43 .47	54 .88	64 .83	68 .81	68 .62	60 .30	50 .23	39 .55	30 .25
1833,.....	29 .07	22 .36	31 .72	49 .91	60 .34	61 .18	68 .48	65 .58	59 .54	47 .76	37 .30	29 .38
1834,.....	22 .43	32 .76	36 .01	48 .04	55 .16	62 .89	72 .86	72 .03	60 .63	46 .94	36 .90	26 .68
1835,.....	24 .20	20 .86	40 .58	42 .15	54 .14	65 .10	69 .69	65 .90	56 .93	52 .09	38 .17	22 .03
1836,.....	23 .59	17 .34	27 .05	42 .38	57 .99	64 .12	69 .48	63 .34	60 .18	39 .87	35 .52	26 .64
1837,.....	18 .93	23 .97	30 .41	39 .98	53 .67	64 .25	67 .15	62 .54	59 .07	46 .78	39 .37	38 .59
1838,.....	30 .39	15 .90	35 .59	38 .44	52 .41	68 .16	72 .69	70 .84	61 .06	45 .59	32 .99	22 .40
1839,.....	23 .87	27 .40	33 .30	49 .48	54 .95	59 .52	69 .91	65 .73	58 .52	52 .07	35 .56	27 .31
1840,.....	17 .52	31 .39	37 .96	48 .36	56 .85	65 .78	70 .95	67 .56	58 .17	48 .17	38 .63	25 .48
1841,.....	27 .53	20 .75	31 .24	41 .05	53 .49	68 .56	68 .87	66 .72	62 .23	43 .74	35 .69	28 .41
1842,.....	27 .75	31 .04	44 .39	47 .24	52 .39	61 .97	67 .85	67 .00	57 .61	48 .21	34 .10	26 .23
1843,.....	18 .00	17 .52	23 .86	46 .62	56 .52	62 .27	68 .67	68 .79	61 .81	45 .27	36 .62	29 .57
1844,.....	17 .17	28 .31	34 .35	52 .10	58 .68	64 .74	68 .42	67 .41	60 .54	46 .63	36 .67	28 .68
1845,.....	26 .70	26 .71	38 .04	45 .85	54 .08	64 .59	69 .92	70 .06	59 .14	50 .32	40 .01	21 .61
1846,.....	26 .28	22 .37	35 .82	49 .36	59 .44	65 .33	69 .93	70 .57	66 .16	48 .37	36 .89	28 .84
1847,.....	25 .19	25 .01	30 .33	42 .47	58 .22	63 .96	72 .20	68 .62	60 .15	46 .99	42 .95	32 .47
1848,.....	24 .08	26 .76	31 .19	45 .32	59 .77	61 .71	68 .91	71 .73	56 .80	50 .06	35 .54	34 .36
1849,.....	21 .63	20 .84	35 .44	43 .53	53 .30	66 .64	70 .96	68 .98	60 .31	48 .72	45 .65	27 .86
1850,.....	31 .22	30 .22	33 .54	42 .57	53 .42	68 .22	72 .24	70 .11	62 .38	50 .45	62 .26	27 .14

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Diagrams have been constructed for representing to the eye the comparative vicissitudes of temperature, and their decadance upon the seasons at different places and for successive years, which will afford essential aid in understanding the numerical tables we have given containing these data. Assuming an arbitrary scale for representing changes of temperature in the vertical direction, and time horizontally, a line is drawn across the diagram, rising or falling with the temperature, and representing by its deflections the changes of heat and cold throughout the year.

The accompanying diagram entitled "Comparative range of temperature at different stations," is a delineation of the mean annual fluctuations of temperature through the several months, at each place where observations were reported ten years or more, and is constructed as follows: The sheet is first ruled with horizontal and vertical lines, the intervals between the former of which represent differences of temperature, and of the latter of time. Every fifth horizontal line is heavier than the others, and the spaces between each of these heavy lines represent ten degrees of temperature. In laying down the curve of each station, the first heavy line below the name of the station is assumed to represent 20°, and the curve is carried through such points on the lines for months, as represent the mean temperatures of each. The spaces between the vertical lines, represent half months, and at intervals figures are placed, to show the temperature at the points of intersection of the curve.

The mean range of temperature throughout the State in each year, as shown by a combination of all the observations, is given in the accompanying diagram, entitled "Comparative range of the thermometer in different years," which is constructed on a plan similar to the one already noticed, except that the intervals between the curves is greater, and a faint line is traced with each, which represents the annual curve for the whole State, and the entire period. The deviation from the mean in particular months and seasons thus becomes strikingly apparent, and a careful study of the facts here figured, will convey to most persons a better knowledge of the subject than could be derived from the tabular statement from which it was constructed.

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TABLE *showing the progress of the seasons, as indicated by the opening and closing of rivers, lakes and canals.*

YEAR.	NAVIGATION OF HUDSON RIVER.			NAVIGATION OF ERIE CANAL.			Lake Erie open at Buffalo.
	Began.	Ended.	Days open.	Began.	Ended.	Days open.	
1826,	Feb. 26,	Dec. 24,	301	April 20,	Dec. 18,	243	
1827,	Mar. 20,	25,	280	22,	18,	241	April 21.
1828,	Feb. 8,	23,	320	Mar. 27,	20,	269	1.
1829,	April 1,	Jan. 11, '30,	296	May 2,	17,	230	May 10.
1830,	Mar. 15,	Dec. 23,	283	April 20,	17,	242	5.
1831,	15,	5,	269	16,	1,	230	8.
1832,	25,	23,	273	25,	21,	241	April 27.
1833,	21,	13,	267	19,	12,	238	23.
1834,	Feb. 21,	15,	297	17,	12,	240	6.
1835,	Mar. 25,	Nov. 30,	250	15,	Nov. 30,	230	May 8.
1836,	April 4,	Dec. 7,	247	25,	26,	216	April 27.
1837,	Mar. 28,	13,	260	20,	Dec. 9,	234	May 16.
1838,	19,	Nov. 25,	251	12,	Nov. 25,	228	March 31.
1839,	21,	Dec. 18,	272	20,	Dec. 16,	241	April 11.
1840,	Feb. 21,	5,	297	20,	3,	228	27.
1841,	Mar. 24,	19,	270	24,	Nov. 30,	221	14.
1842,	Feb. 4,	Nov. 29,	298	20,	28,	222	March 7.
1843,	April 13,	Dec. 9,	240	May 1,	30,	214	May 6.
1844,	Mar. 14,	11,	272	April 15,	26,	222	March 14.
1845,	Feb. 24,	4,	282	15,	29,	228	April 3.
1846,	Mar. 22,	15,	268	16,	25,	224	11.
1847,	19,	24,	280	May 1,	30,	214	23.
1848,	9,	27,	293	1,	Dec. 9,	232	9.
1849,	Feb. 25,	25,	303	1,	5,	219	March 25.
1850,	Mar. 28,	17,	264	April 22,	11,	234	25.

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The earliest date on which the Hudson has been open at Albany during forty-nine years, was February 4, in 1842, and the latest April 8, in 1807, the mean date being March 18. The earliest date of closing during sixty-six years, was November 13, in 1820, and the latest February 3, in 1790, the mean date being December 18. The shortest period during which it remained closed, was forty-two days in 1806, and the longest, one hundred and thirty six days, in 1842–3.

A comparison of the mean temperatures of different years, shows that in 1829, '35, '36, '37, '38, '39, '41, '42 and '43, it was below the general average, while in the other years in the series it was above. In 1830, a summer drouth was followed by copious autumnal rains, and an unusual mildness in November and December, which occasioned vegetation to start up with the vigor of spring growth. In many places buds put forth, and trees blossomed in November. At Flatbush, a second crop of pears attained half size, and peas and beans grew to their full size. At Potsdam, December 4th, marigolds were in full bloom, and thrifty mustard plants were seen six inches high.

In 1834, the spring opened unusually early, and frost and snows in May, destroyed many fruit trees in blossom. During the preceding winter, the snow had been deep, and the ground had not frozen in many sections.

Observations upon the *rain gage*, were directed to be made immediately after each rain, and stations were furnished with instruments of uniform construction for this purpose.

The result of these observations was as follows:

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TABLE *showing the mean depth of rain in the several months at each station.*

STATIONS.	Years observations.	MEAN DEPTH OF RAIN AND MELTED SNOW.													
		January.	Febru'ry	March.	April.	May	June.	July.	August.	Septem'r	October.	Novem'r	Decem'r	Monthly mean.	Annual mean.
Albany,	24	2.91	2.62	3.02	2.88	4.04	4.50	4.09	3.44	3.47	3.76	2.30	2.95	3.42	40.93
Auburn,	22	2.50	2.04	2.13	2.22	3.45	3.57	3.13	3.23	3.20	3.39	2.85	2.72	2.88	34.52
Bridgewater,	4	4.26	2.84	3.01	4.26	3.47	5.36	4.82	2.74	2.55	4.37	4.12	4.35	3.67	44.02
Buffalo,	1	1.74	3.43	1.26	1.21	1.64	1.61	1.10	2.19	3.41	4.03	2.41	2.25	2.27	27.31
Cambridge,	13	3.36	2.61	2.12	3.36	3.65	4.66	3.91	3.98	3.27	3.60	2.29	2.29	3.35	40.14
Canandaigua,	10	2.94	3.13	2.31	2.68	4.53	3.89	3.22	3.12	2.81	3.26	2.77	2.36	3.10	37.15
Cayuga,	7	1.93	1.60	1.64	2.09	3.73	3.75	3.88	3.37	3.11	3.20	2.03	2.12	2.76	33.10
Cherry Valley,	14	3.13	2.62	2.99	3.09	3.67	4.56	4.41	3.19	3.92	3.64	2.17	2.73	3.43	41.14
Clinton,	16	2.22	2.50	2.68	3.58	4.13	2.99	2.93	3.06	3.26	3.63	3.63	3.07	3.22	38.60
Delaware,	2	2.32	2.65	3.02	1.45	5.87	7.18	4.79	3.41	1.96	4.18	1.39	1.65	3.49	41.87
Dutchess,	14	3.20	2.07	2.94	2.72	3.24	3.36	3.68	4.10	2.44	3.88	3.38	3.14	3.18	38.13
Erasmus Hall,	24	3.08	2.88	3.62	3.49	3.61	3.88	3.63	4.12	3.11	3.86	3.79	3.72	3.56	42.74
Fairfield,	18	2.69	1.79	2.36	2.53	3.09	4.29	4.21	3.65	3.08	3.56	2.46	2.74	3.05	36.64
Farmers' Hall,	8	2.59	2.55	2.61	2.05	3.44	3.27	2.95	2.66	2.79	3.13	3.34	3.44	2.83	33.94
Franklin, M.,	3	1.73	2.23	2.04	2.04	2.97	3.38	3.89	1.57	2.75	2.92	2.44	2.09	2.42	29.07
Franklin, P.,	9	1.96	1.83	2.41	2.64	3.15	4.04	3.32	2.51	3.25	2.86	2.41	2.60	2.75	32.98
Fredonia,	16	2.04	1.82	1.99	1.93	3.32	3.83	3.34	3.28	4.46	4.31	2.27	2.96	3.05	36.68
Gaines,	4	2.59	1.72	3.49	2.64	2.47	3.74	3.79	2.45	3.12	1.65	2.01	2.83	2.79	33.50
Gouverneur,	9	2.54	1.87	1.68	1.94	2.44	2.89	2.34	2.21	2.59	3.20	1.16	1.67	2.30	27.61
Granville,	14	2.08	1.42	1.74	2.13	3.47	3.21	3.62	2.97	2.67	2.90	2.88	2.59	2.64	31.69
Hamilton,	18	2.25	2.65	2.27	1.93	2.93	3.48	3.79	2.70	3.68	3.12	2.54	2.78	2.88	34.52
Hartwick,	14	2.66	2.15	2.59	3.10	3.35	4.05	4.24	2.91	3.09	3.54	2.20	2.54	3.11	37.38
Hudson,	17	2.68	2.33	2.77	2.54	3.13	3.68	3.66	2.98	2.73	3.98	2.59	2.89	2.99	35.96
Ithaca,	13	1.82	1.64	2.15	1.84	3.22	3.43	3.35	2.64	3.32	2.56	1.86	1.96	2.57	30.89
Johnstown,	14	3.30	2.77	3.62	2.99	3.45	4.26	4.01	3.14	2.87	3.28	2.33	2.87	3.32	39.82
Kinderhook,	17	2.21	1.53	2.48	2.97	3.41	4.55	4.35	3.35	3.94	3.25	2.69	2.75	2.99	35.81

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TABLE.—(CONTINUED.)

STATIONS.	Years observations.	MEAN DEPTH OF RAIN AND MELTED SNOW.													
		January.	Febru'y	March.	April.	May.	June.	July.	August.	Septem'r	October.	Novem'r	Decem.	Monthly mean.	Annual mean.
Kingston,	19	3.26	2.21	2.97	2.53	3.70	3.84	4.09	2.68	2.24	3.11	3.46	3.34	1.13	37.53
Lansingburgh,	20	2.29	2.07	2.17	2.40	2.78	3.92	3.54	2.52	3.02	3.19	2.82	2.59	2.79	33.47
Lewiston,	13	1.40	1.11	1.39	1.51	1.98	2.46	2.34	1.96	2.59	2.67	1.68	1.11	1.85	22.23
Lowville,	18	2.34	2.38	1.78	1.90	2.79	3.42	3.67	2.84	2.82	3.28	2.94	2.22	2.72	32.69
Mexico,	11	2.27	2.06	2.26	1.40	2.77	2.38	2.75	2.12	2.79	3.94	3.07	3.08	2.56	30.78
Middlebury,	17	1.46	1.77	2.26	2.46	2.92	3.40	3.30	2.81	2.83	2.88	2.56	1.79	2.54	30.47
Millville,	6	2.46	1.88	1.68	2.11	2.13	2.65	2.34	2.09	3.75	3.14	2.75	1.95	2.41	28.94
Monroe,	2	1.66	1.81	1.06	3.21	1.84	3.47	1.53	3.01	3.42	3.98	1.38	.38	2.23	26.75
Montgomery,	13	2.72	2.23	2.25	2.94	2.78	4.07	3.92	2.86	2.38	3.55	2.87	2.36	2.91	34.93
Mount Pleasant,	12	2.15	1.50	2.55	3.57	3.63	3.14	4.46	4.12	3.10	3.22	2.28	2.44	3.02	36.19
Newburg,	17	2.73	2.09	2.26	1.99	4.09	3.52	3.17	3.00	3.19	3.61	3.11	2.25	2.96	35.58
New-York,	3	3.22	4.54	4.99	1.87	6.67	1.77	4.64	3.98	2.88	3.26	4.96	4.27	3.85	46.25
North Salem,	18	3.07	2.27	3.11	3.01	4.19	3.46	4.23	3.61	3.08	4.50	2.29	3.30	3.53	42.41
Ogdensburgh,	1	2.36	.97	1.18	.40	4.81	3.57	1.88	2.55	1.01	2.73	2.07	1.08	2.05	24.61
Oneida Conference,	18	2.46	2.12	2.60	2.78	3.76	4.50	4.10	3.58	3.55	3.58	4.00	2.77	3.19	38.30
Oneida Institute,	7	2.74	1.41	1.34	2.19	2.75	3.39	3.39	2.96	2.54	3.27	2.11	1.96	2.50	30.06
Onondaga,	16	2.54	1.48	1.79	2.02	2.77	3.69	3.41	3.19	2.67	3.26	2.48	1.95	2.62	31.39
Oxford,	17	2.64	1.98	2.25	2.66	3.41	4.08	4.03	2.63	3.25	3.44	2.45	2.25	3.00	36.05
Oyster Bay,	1	1.92	1.67	2.67	4.89	7.08	4.97	6.45	2.10	4.83	2.00	2.24	1.47	3.52	42.29
Palmyra,	1	1.22	.85	1.65	4.00	.98	5.61	4.19	4.08	3.27	5.06	1.96	.93	2.82	33.80
Plattsburgh,	3	3.05	3.28	4.63	2.81	2.35	3.74	2.53	2.81	3.31	4.53	2.43	2.63	3.17	38.09
Pompey,	15	1.87	1.30	1.19	1.56	2.76	4.38	4.11	3.37	3.09	2.90	1.65	1.24	2.45	29.46
Redhook,	10	2.72	1.54	2.43	3.16	3.09	4.15	4.26	2.96	2.61	2.89	2.53	2.48	2.89	34.73
Rochester,	18	1.91	1.37	1.83	2.01	3.08	3.31	2.98	2.66	3.15	3.46	2.90	2.06	2.56	30.77
St. Lawrence,	20	1.40	1.06	1.48	1.70	3.02	3.31	4.03	2.81	3.11	3.34	1.93	1.44	2.39	28.62
Schenectady,	2	7.16	4.52	2.14	4.62	3.07	3.85	3.11	1.92	2.59	2.76	2.77	2.28	3.34	40.79

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Springville,	2	1.18	2.37	1.83	2.95	2.16	3.95	3.60	3.64	4.59	5.82	3.03	2.30	3.12	31.44
Syracuse,	1	2.46	1.83	3.63	1.63	1.10	3.00	2.19	2.15	4.68	5.41	2.83	2.12	2.75	33.03
Union Hall,	25	2.50	2.23	2.83	3.05	3.54	3.69	3.94	4.09	3.38	3.48	3.49	2.85	3.25	39.07
Union Literary Society,	9	1.98	1.83	1.48	1.86	2.45	2.48	2.96	2.60	2.91	4.00	2.86	2.12	2.46	29.55
Utica,	19	2.92	2.61	2.75	3.17	3.34	4.60	4.53	3.70	3.55	2.78	3.43	3.19	3.34	40.09
Washington,	7	1.89	1.36	2.88	1.75	2.33	3.52	4.39	3.09	3.31	3.28	2.46	2.64	2.73	32.80
Mean,		2.51	2.12	2.29	2.53	2.31	3.75	3.59	2.99	3.11	3.44	2.57	2.43	2.91	34.90

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To show the relative quantity of rain in the several seasons, as influenced by the more characteristic topographical features of the State, the following summary is given, in which the monthly means of stations have been grouped into seven classes, based upon circumstances in some degree common to those included in each :

	Spring.	Summer.	Autumn.	Winter.
The Maritime Region, including Clinton, Erasmus Hall, New-York, Oyster Bay, and Union Hall; all except one being on Long Island,	4.07	3.75	3.45	2.93
The Eastern Region, mostly in the valleys of the Hudson and Lake Champlain, including Albany, Cambridge Dutchess, Farmers' Hall, Granville, Hudson, Kinderhook, Kingston, Lansingburgh, Montgomery, Mount Pleasant, Newburgh, North Salem, Plattsburgh, Red Hook, & Washington,	2.92	3.62	3.05	2.56
The Mohawk Valley, includ'g Fairfield, Johnstown, Oneida Inst., Schenectady and Utica,	3.25	3.67	2.96	2.86
The Susquehanna Valley, and its branches, including Bridgewater, Cherry Valley, Delaware, on a branch of Delaware, Franklin, Pa., Hamilton, Hartwick, and Oxford,	3.00	3.92	3.17	2.72
The Valley of the St. Lawrence, including Franklin, M., Gouverneur, Ogdensburgh, and St. Lawrence,	3.14	2.95	2.44	1.71
The Western Region, mostly in the vicinity of the smaller lakes, includ'g Auburn, Canandaigua, Cayuga, Ithaca, Middlebury, Oneida C., Onondaga, Pompey and Syracuse,	2.49	3.40	3.06	2.04

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SUMMARY.—(CONTINUED.)

	Spring.	Summer.	Autumn.	Winter.
The Region of Lakes Erie and Ontario, including Buffalo, Fredonia, Gaines, Lewiston, Lowville, Mexico, Millville, Monroe-Palmyra, Rochester, Springville, and Union Lit. Soc.,.....	2.19	2.95	3.30	1.94
Relative Quantity in the whole State,.....	2.38	3.44	3.04	2.35

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TABLE *showing the mean results of all the observations in the several months and years embraced in the series.*

YEARS.	Greatest No. of stations.	MEAN DEPTH OF RAIN BY YEARS AND MONTHS.												Annual mean.
		January.	February.	March.	April,	May.	June.	July.	August.	September.	October.	November.	December.	
1826, ...	21	2.14	1.74	3.32	1.99	.81	7.02	3.12	2.21	2.88	3.28	2.03	2.06	2.72
1827, ...	30	3.77	3.17	1.95	3.72	2.81	3.48	3.70	4.08	1.00	5.02	2.82	3.32	3.49
1828, ...	33	2.08	2.34	1.90	2.41	3.28	3.74	5.69	3.20	5.29	2.11	4.37	.69	3.19
1829, ...	34	3.14	2.54	2.04	3.62	2.48	3.30	3.16	2.12	3.01	2.42	3.06	2.21	2.76
1830, ...	40	1.85	1.13	3.57	1.95	3.74	6.15	4.15	1.55	2.63	2.78	4.91	4.03	3.20
1831, ...	39	2.49	2.45	2.16	4.10	2.71	3.91	4.42	3.81	3.54	4.34	2.20	1.67	3.15
1832, ...	38	2.82	3.35	2.05	2.39	3.15	1.72	4.00	5.37	2.75	3.09	3.22	3.00	3.07
1833, ...	43	2.20	1.98	1.62	1.31	5.56	3.24	4.41	3.29	2.98	5.11	2.13	2.58	3.03
1834, ...	42	1.75	1.24	1.93	2.72	3.26	4.29	3.38	1.74	2.97	3.23	1.83	2.18	2.54
1835, ...	46	2.68	1.74	1.98	4.03	1.90	4.76	3.61	3.90	1.81	3.32	2.15	1.65	2.79
1836, ...	33	4.59	2.60	1.30	2.24	3.42	4.59	2.58	1.87	2.50	3.03	1.95	2.71	2.78
1837, ...	34	1.97	1.99	3.11	1.85	4.21	4.39	3.69	5.12	2.05	3.29	2.21	2.06	2.99
1838, ...	33	1.69	1.33	1.69	1.49	4.34	4.28	2.44	3.51	3.41	3.66	2.92	1.12	2.65
1839, ...	37	2.56	1.43	1.51	2.42	3.79	4.11	3.92	2.43	2.64	1.39	2.39	3.08	2.64
1840	37	2.02	2.14	2.46	3.40	3.15	3.20	3.13	3.49	3.12	4.43	2.47	2.56	2.96
1841, ...	39	3.37	.88	2.44	3.55	1.98	2.79	2.65	2.65	3.26	1.88	3.03	3.48	2.66
1842, ...	44	1.63	3.06	2.64	2.90	2.33	3.68	4.18	3.43	5.31	2.79	2.98	3.00	3.16
1843, ...	39	1.88	2.09	2.94	2.84	1.90	4.37	2.99	4.35	3.66	4.71	2.76	1.93	3.03
1844, ...	37	2.19	1.07	2.52	1.37	4.85	2.85	4.63	2.99	1.84	3.97	1.76	2.23	2.69
1845, ...	35	2.89	2.63	2.62	2.29	2.52	2.89	2.74	1.92	3.64	2.58	3.51	2.06	2.69
1846, ...	29	2.36	2.25	2.60	1.14	3.92	2.63	4.25	2.78	2.10	3.24	4.72	2.39	2.83
1847, ...	25	3.04	3.29	2.54	1.79	2.09	3.83	3.15	2.99	5.13	3.39	2.59	4.28	3.18
1848, ...	35	1.95	1.39	2.15	1.02	4.95	3.37	4.91	2.45	2.57	3.12	2.05	4.45	3.28
1849, ...	23	1.37	1.51	2.92	1.34	4.11	2.39	1.13	3.75	1.87	6.59	3.22	2.62	2.74
1850, ...	9	2.58	2.77	2.58	2.15	5.51	2.98	5.80	3.63	4.69	3.36	3.11	4.46	3.63

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The above table, contains the results of parts of years reported by observers, while in the preceding one, only entire years are included, from which cause, the mean derived from the two methods will be found to differ in some cases, but the general result shows an excess of rain in the maritime region, and the vallies of the Hudson, Mohawk and Susquehanna, an amount below the average in the western part of the State, in the vicinity of the great lakes, and the least quantity in the valley of the St. Lawrence. The greatest annual mean depth was reported by New-York, and the least by Lewiston, the mean being less than twenty-eight inches at Lewiston, Buffalo, Gouverneur, Monroe, Ogdensburgh and Potsdam, while it was forty inches and upwards, at Albany, Bridgewater, Cambridge, Cherry Valley, Delaware, Jamaica, New-York, North Salem, Oyster Bay, Schenectady, and Utica.

From the last preceding table it appears, that the quantity of rain falling in different years has varied from a monthly mean of 2.64 in 1839, to 3.49; in 1827, the greatest amount in one month, being 7.02, June 1826; and the least, .69, December 1828. The quantity of rain falling is greatest in summer and autumn, and least in winter and spring. The quantity that falls in August, is near the annual mean, while it is most in June, and the least in February.

It has been observed in Europe,* and the observation is confirmed by experience in this country, that, other things being equal, the quantity of rain that falls is less as we recede from the sea coast, thus indicating that oceanic evaporation, is one of the principal sources of rain. The intimate relation between winds from the sea, and rain, will be subsequently noticed.

Difference of altitude, is found also to cause a notable difference in the quantity of rain that falls, and even in the same locality, an elevation of a few feet, is found to produce a remarkable contrast with the quantity at the earth's surface. At the New-York Institution for the Deaf and Dumb, in 1845–6, two similar instruments, five and eighty-five feet from the ground, gave in sixteen months, 60.2, and 44.7 inches respectively. Similar comparative observations at York, in England, at elevations of 0.43$\frac{2}{3}$, and 213 feet from the surface, gave in four years, an annual mean of 22.17, and 13 inches. It is noticed that the decrease upwards is less in warm than in cold weather,

* See Kaemtz's Meteorology, p. 139

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from which it is inferred, that it would be less in low than in high latitudes. This fact seems to indicate, that rain drops continue to increase in size till they reach the ground, although in exceptional cases, by passing through strata of warm dry air, they may diminish from evaporation, or disappear altogether in mid air. Occasionally in fine weather in summer, descending streaks of falling rain, are observed below clouds, which thin out and vanish long before reaching the surface. In the protracted misty rains of autumn and winter, the difference at an elevated point, and at the surface, would be proportionally greater, than in summer showers.

It is a familiar fact, that the capacity of the atmosphere for moisture, is increased by heat and diminished by cold; that condensation of the air is accompanied by an evolution of heat, while its expansion produces cold, and that both the temperature and capacity for moisture diminish as we ascend from the earth's surface. The quantity of aqueous vapor in the atmosphere is constantly varying, and if a given mass of air is gradually cooled, it will descend to a degree of temperature at which it will be saturated by the quantity of vapor contained in it. This temperature is called the *dew-point*, because in summer nights, when by radiation the air at the earth's surface is cooled to this point, dew is formed, from the excess of moisture which it no longer is able to sustain at the reduced temperature. The dew-point varies with the quantity of aqueous vapor in the atmosphere, and its temperature. When this is ascertained it is easy to calculate by the aid of tables that have been constructed, the quantity of vapor corresponding to it.

The instrument now most used for ascertaining the moisture of the air is the psychrometer, which consists of two similar thermometers, the bulb of one of which is covered with thin muslin. When observed, this covered bulb is wet with pure water, the evaporation of which causes a rapid reduction of temperature until it reaches a stationary point. The difference then shown by the two thermometers, affords, by the aid of tables, the force of vapor and relative humidity of the air. Observations upon this instrument did not form a part of the series of records under consideration.

Notwithstanding the quantity of rain received by gages placed at different altitudes at a given place, indicate a much greater quantity at the surface, yet experience has shown that mountains and highlands may be frequently deluged with

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rain, as they are often enveloped in clouds, while the weather of the plains and vallies below is serene. This is caused by the expansion and cooling of the warm and humid air, as it is brought by the winds from a lower level, and carried above the limit in which it is no longer able to support its vapor.

The remarkable dryness of our climate when compared with that of Europe, has often been remarked, and its cause must be ascribed to the prevalence of our westerly winds, which pass over the Rocky mountains, and a broad extent of continent instead of ocean. Hence our astronomical observatories are favored with more frequent and longer opportunities for observation, and manufactures depending upon evaporation or the drying process for their success, can be conducted with greater economy in this country. On the other hand, we cannot compete with Europe in some of the finer texile fabrics, which can be spun and woven best in a moist atmosphere.

That this dryness may have an influence upon the habits and customs of our people is highly probable, and a long series of observation may even show that intellectual activity, dependent upon bodily health, may be found to bear a certain relation to the difference of atmospheric conditions.

The excess of our summer and fall rains over those of winter and spring, is noticed to increase from south to north, thus in a measure reversing the order observed in tropical climates, in which the heaviest rains occur in their winter months.

The relative amount of cloudy sky does not bear so close a relation to the depth of rain at a given place as would be supposed, for the formation of clouds is influenced by circumstances of elevation, vicinity to mountains or lakes, &c. Summer showers sometimes fall miles to the leeward of the place where they originated, and local causes may produce a great difference between the relative amount of cloud and fall of rain in certain localities. The following table embraces the general results of observations upon the aspect of sky at the various stations embraced in the series, for the periods noted in each. Two entries of this class were made daily, one for the forenoon and the other for the afternoon, at no particular hour:

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	Years.	Clear days per month.	Cloudy days per month.
Albany,	24	17.04	13.36
Amenia,	1	15.79	14.62
Auburn,	22	14.88	15.56
Bridgewater,	4	13.01	17.40
Buffalo,	2	14.98	15.48
Cambridge,	14	15.65	14.79
Canajoharie,	2	15.33	15.10
Canandaigua	10	13.68	16.67
Cayuga,	13	14.95	15.48
Cherry Valley,	15	14.94	15.49
Clinton,	17	20.41	9.93
Cortland,	18	14.20	16.24
Delaware,	2	19.21	11.25
Dutchess,	16	17.16	13.37
Erasmus Hall,	24	18.26	21.31
Fairfield,	19	11.13	18.31
Farmers' Hall,	11	19.16	11.28
Franklin, M.,	3	12.28	18.16
Franklin, P.,	10	16.62	13.82
Fredonia,	18	13.03	17.31
Gaines,	4	13.77	16.67
Gouverneur,	12	15.13	15.31
Granville,	14	17.64	12.80
Greenville,	1	15.95	19.45
Hamilton,	17	14.14	16.30
Hartwick,	16	14.07	16.37
Hudson,	17	15.95	14.49
Ithaca,	16	15.56	14.88
Johnstown,	16	17.53	12.91
Kinderhook,	17	15.06	15.38
Kingston,	20	18.18	12.19
Lansingburgh,	20	16.28	13.16
Lewiston,	18	16.41	14.03
Lowville,	19	13.32	17.11
Mexico,	11	15.76	14.68
Middleburg,	18	15.35	14.69
Millville,	8	14.79	15.64
Monroe,	3	16.91	13.53
Montgomery,	13	16.19	13.75
Mount Pleasant,	12	17.17	13.27
Newburgh,	18	16.96	13.48

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	Years.	Clear days per month.	Cloudy days per month.
New-York,	5	12.50	17.90
North Salem,	19	18.37	12.06
Ogdensburgh	1	15.00	15.41
Oneida Conf.,	18	13.19	17.25
Oneida Inst.,	7	16.37	14.01
Onondaga,	16	14.86	15.58
Oxford,	17	13.50	16.89
Oyster Bay,	2	17.81	12.60
Palmyra,	1	15.46	19.95
Plattsburgh	5	15.70	15.70
Pompey,	17	13.61	16.83
Redhook,	12	18.35	12.09
Rochester,	19	13.90	16.54
St. Lawrence,	21	14.18	15.26
Schenectady,	3	16.20	14.14
Springville,	8	11.43	18.57
Syracuse,	1	13.16	17.25
Union Hall,	25	18.59	11.93
Union Literary Society,	9	15.21	15.14
Utica,	22	16.75	12.73
Washington,	11	16.12	14.32
Mean,		15.56	14.76

The relative amount of clear and cloudy sky in the several months, is shown in the following table, which indicates a progressive increase of serene sky from December to July, from which it declines to the following December:

Months.	Clear.	Cloudy.
January,	12.34	18.35
February,	12.72	15.57
March,	15.45	15.55
April,	16.36	16.56
May,	17.41	13.56
June,	17.47	12.56
July,	20.13	10.84
August,	19.56	11.10
September,	18.87	11.15
October,	15.81	15.19
November,	11.56	18.56
December,	10.56	20.09

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The number of cloudy days, exceeds those that are clear, at twenty-seven of the sixty-two stations. At Clinton Academy, near the east end of Long Island, the amount of clear sky is greatest, and at Springville, near Lake Erie, the least—the extremes differing twenty-eight per cent of the whole time. So far as generalization can be applied, those stations adjacent to lakes, and those exceeding 800 feet in altitude, have an excess of cloudy days. The months of March and October, have a mean approaching that of the whole year.

No scale of cloudiness was adopted, and these observations do not tend to show how far the formation of cloud is influenced by the direction of the wind, by temperature, barometric pressure, or hydrometric conditions. It is commonly noticed in this State that continued north or north-west winds bring a clear sky and low temperature, while southerly and easterly winds bring clouds and rain, especially if they continue with violence during a few hours.

The presence of solar and lunar haloes, indicating the existence of minute spiculæ of ice in the upper region of clouds, has been popularly considered a precursor of rain, and observation has shown that this belief has some foundation in fact. Haloes are always seen in cirrus clouds, and are observed most frequently when the barometer is falling, especially in summer. Solar haloes occur most frequently in the spring months, while lunar haloes are seen most frequently in winter, the longer time during which the moon is above the horizon in that season, being favorable for their observation, and the conditions necessary for their formation being then most prevalent.

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TABLE *showing the total number of days on which the Solar and Lunar haloes were observed during the several months and years embraced in the series.*

YEARS.	January.		February		March.		April.		May.		June.		July.		August.		Septem'r		October.		Novem'r.		Decem'r.	
	Solar.	Lunar.	Solar.	Lunar.	Solar.	Lunar.	Solar.	Lunar.	Solar.	Lunar.	Solar.	Lunar	Solar.	Lunar.	Solar.	Lunar.	Solar.	Lunar.	Solar.	Lunar.	Solar.	Lunar.	Solar.	Lunar.
1826,	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....
1827,	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1828,	1	3	....	1	....	....	2	3	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
1829,	....	....	....	....	1	....	....	1	....	1	....	1	....	....	....	....	....	2	....	....	....	1	....	2
1830,	....	....	....	2	....	3	....	2	2	3	....	....	1	1	1	....	....	1	....	....	....	1	....	1
1831,	3	....	1	2	2	4	1	....	1	2	....	1	....	1	....	1	....	....	....	....	....	....	....	....
1832,	....	1	....	....	....	1	....	1	....	....	....	....	....	1	....	....	1	1	....	....	....	....	....	....
1833,	1	2	2	1	1	2	1	....	....	1	....	....	....	....	1	....	1	1	....	1	....	....	2	1
1834,	1	1	....	4	1	1	2	1	....	....	....	....	1	....	2	....	....	1	....	....	1	2	....	3
1835,	2	3	1	4	4	1	1	....	....	1	1	1	....	....	....	....	2	....	1	1	....	....	....	1
1836,	....	....	....	1	....	2	1	2	....	1	....	....	....	....	....	....	....	1	1	2	....	2	....	3
1837,	....	1	....	....	....	1	4	4	4	1	....	1	....	....	....	....	....	1	3	2	....	2	....	2
1838,	....	3	1	....	2	1	2	2	3	2	1	....	1	....	1	....	....	....	....	2	....	2	....	2
1839,	....	3	1	1	1	5	....	2	1	1	1	....	1	....	....	....	....	2	2	2	....	1	....	2
1840,	4	2	2	4	1	3	4	4	1	2	1	4	2	1	2	2	1	2	1	3	1	3	2	4
1841,	2	....	4	2	6	4	2	1	10	....	4	....	3	....	3	....	1	....	1	....	....	2	....	3
1842,	7	8	6	5	9	2	9	3	5	2	2	4	4	....	3	1	1	2	1	1	3	1	2	4
1843,	2	7	4	4	9	2	4	3	13	3	6	1	1	4	....	3	5	3	1	4	....	3	3	1
1844,	4	6	4	5	4	5	8	....	4	....	....	....	....	1	2	....	2	....	1	....	1	7	....	3
1845,	....	3	7	7	5	1	4	2	7	2	2	1	1	1	4	....	1	....	4	....	2	2	....	2
1846,	5	2	5	9	6	2	3	5	5	1	....	2	2	1	3	....	1	2	2	1	3	6	2	7

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1847, ...	2	4	3	8	5	4	8	4	6	8	1	2	4	1	1	8	3	2	1	8	8	9	2	5
1848, ...	2	3	6	4	4	2	3	8	6	5	1	2	2	2	2	1	3	1	....	1	3	2	....	3
1849, ...	5	8	9	3	2	3	4	2	2	2	4	1	5	1	....	1	1	1	2	1	1	3	....	4
Total, ...	41	56	56	58	63	49	63	45	70	34	34	23	28	15	25	13	23	24	21	24	18	45	13	53

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Total number of days on which solar haloes were seen,.. 455
do do lunar do .. 439
Seen in winter months, solar, 110; lunar, 167. Total,.. 277
do spring do 196; do 128. Total,.. 424
do summer, do 87; do 51. Total,.. 138
do autumnal, do 62; do 93. Total,.. 155

On several occasions remarkable combinations of arcs and circles were noticed in solar and lunar haloes.

Coronæ, or small colored circles around the sun or moon, when veiled with thin fleecy clouds, are of frequent occurrence, and were seldom recorded. They are formed by the diffraction of light passing through vesicular vapor, as in fogs, and are commonly noticed in thin dissolving cumulus clouds.

The *direction and force of the winds*, are found to have an important relation to temperature and rain, and in the observations of the New-York academies, the prevailing direction of the wind in the forenoon and afternoon of each day was required to be noted, but not at any fixed hour. It is an unfortunate fact, that the true course of the atmospheric currents at a given place can not always be satisfactorily determined, because the surface wind often differs considerably from that in the region of the clouds, and in a clear sky or in the night time, there is no method of ascertaining the direction of the upper currents. There was no notation adopted to indicate the relative force or velocity of the wind in these observations. The following table gives the results at the several stations. The surface current, and not that shown by the clouds, was noted.

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TABLE *showing the mean direction and resultant of winds at the several stations.*

STATIONS.	Years observations	MEAN DIRECTION OF WINDS.								RESULTANTS OF WINDS.		
		North.	N. East.	East.	S. East.	South.	S. West.	West.	N. West.	Mean direction.	Pr. ct.	Days.
Albany,	24	4.11	1.98	.60	1.63	9.64	2.13	3.02	7.34	S. 76 19′ W.,	22	6.76
Amenia,	1	5.71	3.04	.46	2.54	6.46	4.50	1.25	6.46	N. 67 58 W.,	16	4.71
Auburn.	22	3.19	1.10	.38	2.26	6.98	5.91	2.32	8.33	S. 73 14 W.,	33	16.05
Bridgewater.	4	1.38	.38	1.20	1.19	8.07	4.56	9.70	4.36	S. 61 35 W.,	52	15.58
Buffalo,	2	6.69	4.02	2.58	2.85	2.75	10·69	3.42	3.71	S. 45 00 W.,	29	8.71
Cambridge,	14	.83	1.60	.17	.61	7.08	5.94	4.03	4.79	S. 87 55 W.,	33	9.91
Canajoharie,	2	.13	.02	3.79	6.08	.85	1.67	7.94	9.66	N. 85 20 W.,	26	7.86
Canandaigua,	10	1.12	.50	.59	1.24	7.91	4.22	10.89	4.09	S. 63 37 W.,	55	16.67
Cayuga,	13	5.85	.67	.52	1.58	9.49	2.89	3.87	5.59	S. 73 01 W.,	8.11	8.11
Cherry Valley,	15	1.46	1.96	1.71	.89	3.96	6.10	10.17	4.25	S. 77 27 W.,	47	14.08
Clinton,	17	2.17	3.51	3.67	3.08	3.77	4.70	3.55	3.88	S. 34 35 W.,	7	2.27
Cortland,	18	.07	.10	.12	2.30	4.93	8.89	1.56	12.46	S. 75 17 W.,	51	15.35
Delaware,	2	1.95	1.27	1.00	.95	5.60	8.47	6.54	4.72	S. 64 68 W.,	49	14.72
Dutchess,	16	5.81	3.38	.62	4.85	4.85	5.01	2.19	3.72	N. 80 21 W.,	12	3.57
Erasmus Hall,	24	2.15	4.82	.61	2.88	2.51	6.67	3.02	7.77	N. 76 00 W.,	24	7.39
Fairfield,	19	.27	.33	5.03	4.84	.65	1.39	8.27	9.96	N. 71 53 W.,	27	8.01
Farmers' Hall,	11	1.07	5.85	1.14	1.12	2.75	8.89	6.22	3.48	S. 76 20 W.,	30	9.14
Franklin, M.,	3	1.19	2.94	.63	1.44	3.85	6.71	9.73	4.01	S. 79 35 W.,	46	13.77
Franklin, P.,	10	1.96	.80	.52	.94	6.33	3.77	5.41	11.08	N. 87 34 W.,	48	14.23
Fredonia,	18	2.49	1.88	1.19	1.75	4.66	5.36	1.64	2.41	S. 71 26 W.,	43	13.07
Gaines,	4	1.41	3.27	1.78	2.73	1.24	6.29	3.64	9.99	N. 71 01 W.,	32	9.55
Gouverneur,	12	3.50	3.18	.64	1.34	3.85	8.50	4.62	4.76	S. 80 30 W.,	34	10.30
Granville,	14	10.24	.91	.23	1.08	7.50	7.77	1.26	1.43	S. 73 07 W.,	21	6.40
Greenville,	1	.71	2.95	1.08	9.46	.95	1.62	1.95	11.67	N. 34 49 W.,	9	2.68
Hamilton,	17	1.73	.90	.29	1 21	5.45	6.69	3.02	11.07	S. 86 28 W.,	46	13.80
Hartwick,	16	1.32	.87	.49	1.15	11.16	2.76	4.23	8.50	S. 60 11 W.,	40	11.95

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TABLE.—(CONTINUED.)

STATIONS.	Years' observations	MEAN DIRECTION OF WINDS.								RESULTANTS OF WINDS.		
		North.	N. East.	East.	S. East.	South.	S. West.	West.	N. West.	Mean direction.	Pr. ct.	Days.
Hudson,	17	6.95	1.66	.73	4.68	7.75	1.09	1.04	5.99	N. 70° 37′ W.,	5	1.47
Ithaca,	16	2.98	.95	.59	2.58	5.85	3.95	1.59	10.88	N. 85 38 W.,	37	11.03
Johnstown,	14	.19	2.39	4.99	1.58	.37	2.55	16.12	2.25	N. 89 07 W.,	39	11.72
Kinderhook,	17	1.20	.45	.36	.92	11.23	.95	.61	3.71	N. 45 13 W.,	12	3.64
Kingston,	20	1.70	7.09	.88	2.77	2.89	6.60	2.28	6.51	N. 63 00 W.,	14	4.10
Lansingburgh,	20	3.98	.94	.22	2.07	7.83	3.21	6.61	5.46	S. 78 50 W.,	35	16.59
Lewiston,	18	2.37	2.58	1.59	1.60	4.57	10.75	4.07	2.89	S. 52 57 W.,	38	11.58
Lowville,	19	5.31	.64	.46	3.73	6.83	2.45	3.87	7.00	S. 86 24 W.,	26	7.17
Mexico,	11	2.07	.89	1.52	4.88	3.75	2.86	9.69	4.87	S. 72 08 W.,	33	10.07
Middlebury,	18	2.31	1.68	.36	.54	1.49	14.90	5.41	3.74	S. 69 23 W.,	59	17.80
Millville,	8	1.65	3.71	1.63	2.90	2.32	8.92	3.25	6.05	S. 74 18 W.,	26	7.85
Monroe,	3	3.29	1.47	1.78	1.40	6.82	7.07	5.06	3.39	S. 53 48 W.,	42	12.66
Montgomery,	13	3.25	3.23	.91	1.45	4.66	4.48	7.02	5.44	N. 86 59 W.,	33	9.88
Mount Pleasant,	12	4.28	2.72	.67	2.79	6.21	4.02	1.49	8.23	N. 80 52 W.,	19	5.67
Newburgh,	18	2.85	5.72	.64	1.88	4.18	6.93	3.85	4.36	S. 85 40 W.,	19	5.84
New-York,	5	1.18	5.90	.53	4.03	.90	4.59	5.63	7.39	N. 78 45 W.,	28	8.56
North Salem,	19	1.65	3.29	1.42	3.72	2.78	6.44	3.52	7.59	S. 84 59 W.,	23	7.09
Ogdensburgh,	1	1.71	5.88	.62	.67	3.41	10.58	4.50	3.04	S. 69 18 W.,	31	9.47
Oneida Conference,	18	.88	.51	.56	1.82	5.27	5.83	5.64	9.92	S. 80 34 W.,	48	14.93
Oneida Institute,	7	1.39	.63	6.55	1.76	2.73	2.76	11.53	8.08	S. 77 18 W.,	25	7.48
Onondaga,	16	1.56	.76	1.17	2.15	7.91	2.23	8.19	6.38	S. 58 17 W.,	39	11.90
Oxford,	17	5.39	2.34	3.34	.49	3.99	6.74	7.10	6.04	N. 89 03 W.,	44	14.30
Oyster Bay,	2	.89	6.58	.73	3.27	2.23	7.88	1.62	7.23	N. 83 34 W.,	15	4.64
Palmyra,	1	1.88	2.25	.79	6.04	1.58	6.79	4.92	6.21	S. 69 10 W.,	26	7.98
Plattsburgh,	5	6.62	1.39	.45	2.49	9.45	1.09	3.12	5.82	N. 79 32 W.,	16	6.33
Pompey,	17	.37	.88	.19	3.11	4.75	7.69	6.50	7.42	S. 66 34 W.,	51	15.44

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Redhook,	12	8.97	2.42	1.39	2.12	9.78	1.17	1.32	1.84	S. 84	06	E.,	3	1.18
Rochester,	19	2.16	2.75	1.12	2.09	2.12	5.80	6.79	7.51	N. 81	58	W.,	39	11.74
St. Lawrence,	21	1.83	4.75	.25	.99	4.26	11.04	2.49	4.85	S. 55	15	W.,	34	10.29
Schenectady,	3	1.39	1.62	1.18	4.76	3.90	1.33	7.73	8.51	N. 87	33	W.,	31	9.35
Springville,	7	1.81	2.33	1.29	1.70	1.87	6.48	8.91	4.96	S. 86	59	W.,	42	12.72
Syracuse,	1	.33	.75	2.29	4.33	3.00	3.25	10.37	6.08	S. 73	54	W.,	38	11.56
Union Hall,	25	2.20	3.89	1.34	2.55	2.93	5.92	2.81	8.19	N. 75	07	W.,	24	11.93
Union Lit. S.,	9	2.54	3.27	1.18	2.61	5.92	4.95	6.31	3.32	S. 59	12	W.,	26	8.13
Utica,	22	.14	.15	6.30	2.39	1.90	2.35	15.12	1.25	S. 66	39	W.,	39	12.73
Washington,	10	5.36	3.61	.23	.80	4.92	10.31	2.20	2.99	S. 71	35	W.,	29	8.70
Mean,		2.81	2.81	1.26	2.44	4.76	5.42	5.54	6.04	S. 80°	00′	W.,	30	9.16

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TABLE *showing the general average direction of the winds derived from a combination of all the stations reporting, including parts of years.*

	Greatest No. of stations reporti'g	RESULTS OF WINDS BY YEARS AND MONTHS.							
		North.	N. East.	East.	S. East.	South.	S. West.	West.	N. West.
1826,	21	2.74	1.57	1.17	2.79	5.59	4.52	5.15	6·51
1827,	30	3.04	1.65	1.39	2.06	4.73	4.52	5.81	6.94
1828,	33	2.23	1.47	1.64	2.15	5.70	6.17	5.37	5·77
1829,	35	2.31	1.86	1.32	2.03	4.88	6.20	6.14	5·95
1830,	40	3.22	2.49	1.52	1.90	5.34	5.15	5.22	5·57
1831,	39	2.94	1.82	1.06	1.84	5.28	5.56	6.18	5·71
1832,	38	3.41	2.01	1.17	2.13	6.17	5.46	4.72	5·42
1833,	43	3.04	2.19	1.07	2.49	5.41	5.36	5.02	5·81
1834,	42	3.12	2.39	1.15	2.27	4.82	5.74	4.92	6.04
1835,	46	2.67	2.09	1.22	2.15	4.92	6.32	5.69	5·35
1836,	33	2.90	2.58	1.83	2.92	4.89	4.49	5.49	5·48
1837,	34	3.11	1.87	1.39	1.23	5·21	4.45	5.58	6.59
1838,	33	2.64	2.29	.99	1.93	4.36	5.83	5.50	7.00
1839,	37	3.35	2.52	1.16	1.99	4.88.	5.64	4.72	6.18
1840,	37	2.68	2·25	.98	2.22	5.02	5.69	5.16	6.54
1841,	39	3.71	2.56	1.11	2.01	5.34	4.73	4.93	5.95
1842,	44	2.80	2·30	1.19	2.23	5.39	5.14	5.39	6.02
1843,	39	2.87	2.12	1.21	2.08	4.41	5.41	6.09	6.19
1844,	37	3.17	2.54	1.22	2.10	4.96	5.28	5.40	5.81
1845,	39	2.90	1.69	1.08	1.99	4.92	6.09	5.37	6.37
1846,	29	3.44	2.69	.83	2.62	4.87	5.53	4.19	6.31
1847,	25	3.05	2.66	1.00	2.28	5.17	6.23	3.81	6.22
1848,	25	2.53	2.04	1.16	2.44	5.26	5.19	4.65	7.21
1849,	23	3.39	2.77	.98	3.60	4.59	4.52	3.68	6.88
1850,	9	2.88	2.02	1.57	1.95	3.91	5.93	3.05	7.06

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One of the most striking results of the observations upon the winds, is the correspondence between their direction and that of the vallies in which the stations are located. At most of those on the Hudson, northerly and southerly winds were recorded in the greatest number; in the Mohawk valley, easterly and westerly or north-westerly winds; and at nearly every other place, the prevailing direction of the neighboring hills and valleys was found to influence that of the surface current. A close observation of the direction of the clouds would give a much more correct knowledge of the true motion of the winds at a given place.

The hills and valleys of New-York are for the most part northerly and southerly in direction, the principal exception being the narrow and deep valley of the Mohawk. Lake Champlain may be said to lie in a continuation of the Hudson river valley, and the ridges and mountains that border both the lake and the river, have the same general direction. The mountain ranges between the Mohawk and the St. Lawrence, and the highlands of Orange county, have a north-easterly and south-westerly trend. The Catskill mountains have a north-westerly and south-easterly course, while the prevailing direction of the hills, valleys, rivers, and lakes of the central and western portions of the State is north and south. The counties bordering upon Pennsylvania are wholly or in part drained by the head waters of the Allegany, Susquehanna, and Delaware rivers, between which occur ranges of hills, constituting prolongations of the Allegany mountains, and having the same prevailing course.

With a knowledge of these influences, and the almost daily experience of their effects, it would naturally be inferred that the ultimate direction of the atmospheric currents across this State corresponded with the course most generally observed, and that the final result would show a northerly or southerly wind; but the combination of a series of records at a given place, almost uniformly shows, that the *resultant** or mean

* The resultant, or mean direction of the wind, is that course which it would take if simultaneously acted upon by forces proportioned in direction and amount to the combined observation of these elements in a given period; as for example, if the wind were to blow with uniform velocity six days from the north, and seven from the south, its progress would be one day from the south towards the north. As the wind blows longer in some directions than others, it is evident, that after deducting opposite quantities, and reducing the oblique directions to a single one, the result would show a final progress in the line of the largest force or longest time. The problem is like that for finding the direction and distance of a ship at sea

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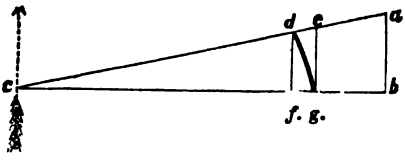
direction of the winds of our State is nearly at right angles with the prevailing course of our hills and vallies, thus agreeing with observations made elsewhere in the United States and Europe, and proving the influence and operation of great general laws, whose action encircles the globe itself.

The comparison of an extensive series of records made at 579 stations during an aggregate period of 2,829 years, in various parts of the northern hemisphere, has been made by Professor J. H. Coffin,* who derives from these data the general fact, that a zone or belt of westerly winds, about twenty-three and a half degrees wide, and embracing the southern portion of British America, all of the United States except its southern part, and nearly the whole of Europe, extends around the globe, having the pole of its southern as well as its northern limit, near a point in latitude north eighty-four degrees, and longitude west 105 degrees. Of 251 stations within the United States, all but six, had the mean direction of the wind westerly, the rate of progress being commonly greater as the direction approached a west point. The average rate at all of the stations was thirty per cent, while at the exceptional ones it was but eighteen.

Of the sixty-two stations embraced in the series under consideration, thirty-four have the mean direction south, and

from its starting point, after sailing in different directions a given time. In the absence of records of the velocity of the wind, it has been assumed to be uniform.

We will take the following example, and suppose that during a month the wind has blown from the N., 4.07; N. E., 1.50; E., .05; S. E., 1.85; S., 5.85; S. W., 3.88; W., 6.32; and N. W., 7.48 days. By subtracting opposite points we have S., 1.78; S. W., 2.38; W., 6.27; N. W., 5.63. By analyzing the S. W. into S. and W., by the aid of a traverse table, we find that 2.38 S. W. = 1.68 S., and 1.68 W., and that the 5.63 N. W. = 5.67 N. and 5.67 W. By adding together the above, and subtracting S. from N., we have N. .58 and W. 11.94 as their sum; and the problem becomes that of reducing these two directions to one, by the ordinary methods of trigonometry.



In the annexed figure, let *ab*, represent the *northing* = '58, and *bc*, the *westing*, = 11.94; it is required to find the supplement of the angle *c*, or the angle which the line *ca* makes with the dotted index line representing north and south, and the line *ca*, which is the amount or value of the resultant.

By drawing the arc *dg*, the sine *df*, and the tangent *eg*, we have from similar triangles, *cb* : *ba* : : *cg* : *ge*. This, when reduced, gives the northing divided by the westing=tangent of the course, which in this instance= N. 78° 22′ W. The proportion *df* : *cd* : : *ba* : *ca*, in a similar manner gives the northing divided by the sine of the course=the value of the resultant, which in this instance=11.95 days.

* Winds of the Northern Hemisphere; Smithsonian Contributions to Knowledge, Vol. VI.

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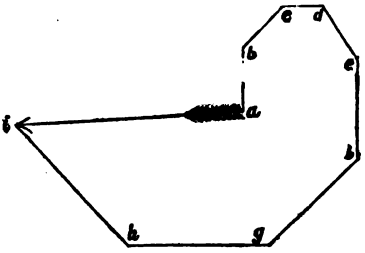
twenty-eight north, of that of the whole State, or a point S. 80 degrees W. Of these there were within

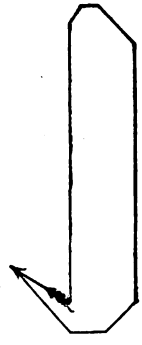
5	degrees of S. 80	degrees W.,	4	north and	10	south.
10	"	"	2	"	7	"
15	"	"	6	"	8	"
20	"	"	4	"	4	"
25	"	"	5	"	1	"
30	"	"	4	"	2	"
35	"	"	0	"	1	"
40	"	"	1	"	1	"
over 40	"	"	2	"	0	"

With a single exception, the mean directions are embraced within an arc of 111 degrees, 11 minutes, from S. 34 degrees W., to N. 34 degrees, 49 minutes W. The effect of a north and south valley, is to shorten very much the amount of the resultant, while that of an east and west valley is to lengthen it. This may be conveniently shown by diagrams.



If in the annexed figure, the lines *ab*, *bc*, *cd*, *de*, *ef*, *fg*, *gh*, *hi*, represent in direction and length the sum of all the winds that blow from the several points in a given month, the arrow *ia*, will represent the resultant of the winds, and the sum of the broken lines *ab*, *bc*, &c., to *i*, the entire period of the month. It is evident that the prevalence of northerly and southerly winds as at Kinderhook, would give the figure a vertical elongation and very much shorten the resultant, while at places situated like Utica, in an east and west valley, the elongation would be horizontal, and the resultant increased in quantity. The relative prevalence of winds may also be shown, and the modifying influences of local causes demonstrated, by laying off

Winds at Utica.



W'd at Kind'hook.

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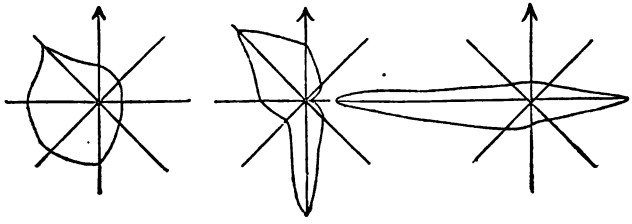
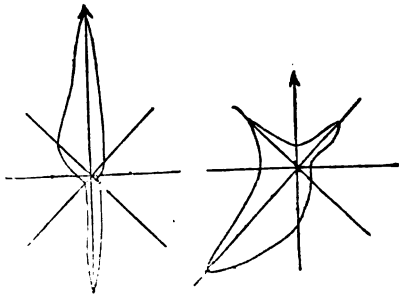
from a central point, in different directions, distances proportioned to the prevalence of winds f'm the sev'al points and connecting the spaces thus laid off by a line, as shown by the annexed figures, in which the final results of the winds of the whole State, and of Albany, Utica, Kinderhook, and St. Lawrence are delineated. In general, the winds in this State, are more northerly in the first half of the year, and more southerly in the other half than the annual average, which in the memoir above cited, is attributed to the fact, that during the winter, the Atlantic ocean is warmer than the adjacent continents, and that necessarily there must be a tendency of the colder air from the land to the sea; while in the opposite season, the lands being warmer, the tendency of the winds is reversed. The winds of our latitude, therefore, in some degree partake of the character of the monsoons of the Indian ocean, although in a comparatively feeble degree. The winds of July, are generally coincident in direction with the annual mean.



Whole State. Albany. Utica.



Kinderhook. St. Lawrence.

Strongly marked physical features, extending over large areas, tend to produce regularity in the winds, and their relative humidity or dryness depends upon the nature of the surface over which they have passed. The progressive motion of winds is less in Europe than in this country, and from the change in relative position of sea and land, their character, as to humidity and dryness, is reversed. In France and England the most tedious and unpleasant rains are brought by west winds, and as these winds prevail, the relative amount of clear sky is much less than in this country.* In one hun-

* On our Pacific coast the prevalence of westerly trade winds gives a great uniformity to the temperature, and most of the rains come from that quarter. By passing up the slopes of the

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dred showers which fell at Berlin, the different winds blew in the following proportions:

N.	N. E.	E.	S. E.	S.	S.W.	W.	N.W.
4.1	4.0	4.9	4.9	10.2	32.8	24.8	14.4

In the summer season, ocean winds may prevail for a longer time without rain than in winter, as they are not then so readily cooled down to the temperature at which rain is precipitated. It remains to be settled, by a long course of observation, how much the tendency to rain or drouth is varied from the primitive condition of a forest-covered country by cultivation, and how far the clearing up of these forests, the opening to the sun of marshes and low lands, may vary the rate of evaporation, or affect the precipitation of rain.

It has been often remarked, that springs and small streams diminish or disappear entirely as a country becomes settled; that extreme wet or dry seasons take the place of those more uniform, and that with a diminution of forests there follows a tendency to sudden floods and unusual drouth in rivers and brooks. This change, produced by cultivation, doubtless, has its limit, and the trifling changes which man can produce on the earth's surface must sink into insignificance when compared with the unchangeable features of nature. On this subject Dove has beautifully remarked:

"The natural inference from all this is, that with increased cultivation of the country, when all material for combustion has to be sought under the earth, the continually increasing population of the earth, in its effort to maintain itself, will plant in nature the germ of a period of death, when vapors shall no more condense into clouds over the treeless earth, and even the seed in the soil, refreshed only by dew, will lose its power of budding, or, if it should shoot up, would slowly wither and die. But the world, as well as the whole universe, is so ruled as to bear within itself both a principle of destruction and of preservation: it is thus—in the petty earth which we inhabit. No matter what changes may affect the outer surface of the earth, the permanent remains permanent, and the changeable changeable; for what, in proportion to the great

Rocky mountains, the moisture gets condensed, so that to the eastward the west winds are dry. It has been well remarked of the northern Atlantic States: "So long as the westerly winds continue to blow in winter there is no cessation of your cold, and so long as it continues to blow in a broad regular stream in summer there is no end to your drouth."—ROBERT RUSSELL'S *Lecture before Smithsonian Institution*, 9th Rep., S. I, p. 196.

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features of sea and land, are the trifling changes of drained lakes and dried up ponds? If the sun stands over the southern hemisphere with its broad waters, there will then be a greater extent touched by the warmth thus created, than if it beam in northerly limits over a broad solid surface. The vapors with which the atmosphere becomes charged in excess, between the autumn and the spring equinoxes in the southern hemisphere, return in the other half year back to the earth in the shape of snow and rain, and in excess, over the northern hemisphere."

The extreme drouth of the summer of 1854, and the excess of rains in 1855, in our State, afford a striking example of the inequality of distribution of rains to which we may become liable, while the total results of a long series of years would show no material change. This inconvenience will be less with us than in the north-western States, from our greater exposure to the precipitation of vapors from the sea. Boussingault has shown, that in South America the springs that had dried up in the settlements, returned as the forests won back the ground, abandoned by the colonists on account of the revolutions, and in a like proportion the rains again became more frequent.

If, as suggested by Dove, the cultivation of ten years by the French in Algiers has added more than one rainy day to July, it may not be deemed improper to inquire, whether the ornamenting of rural dwellings and the public roads with shade trees, may not have a salutary influence upon climate, by tending to equalize the fall of rain. In many instances the inconvenience of drouth in rivers and streams may be cheaply avoided, by the retention of the excess of winter rains in natural reservoirs, enlarged by the building of barriers across their outlets. The opposite extremes of flood and drouth would be then avoided, and calculation has shown even the possibility of maintaining the navigation of the Ohio river in the dryest seasons by the aid of these artificial supplies, retained from the spring flood.

Observations upon the *Aurora borealis* show that this phenomenon appeared on 1,152 days in the entire period—or about 46 days in each year. They were distributed according to the following table.

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TABLE *showing the distribution of Auroras through the several years and months.*

YEARS.	January.	Febru'ry	March.	April.	May.	June.	July.	August.	Septem'r	October.	Novem'r	Decem'r.	Total.
1826,	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	2
1827,	1	.....	.....	2	.....	.....	.....	5	3	1	1	1	14
1828,	3	2	.....	2	.....	.....	1	2	6	3	1	1	21
1829,	3	.....	.....	3	2	5	.....	2	3	3	1	2	24
1830,	1	4	4	5	10	7	5	12	8	14	4	5	80
1831,	3	4	15	6	2	8	11	1	1	3	.....	1	55
1832,	1	.....	2	5	3	3	.....	4	3	2	1	.....	24
1833,	1	.....	2	3	4	2	3	3	10	6	1	2	37
1834,	3	2	6	2	1	.....	2	2	1	8	2	6	35
1835,	5	3	2	1	.....	2	2	2	7	1	4	1	30
1836,	.....	2	1	9	4	10	10	11	3	4	6	1	61
1837,	4	2	6	6	3	3	5	5	8	2	5	1	50
1838,	5	4	.....	4	1	3	4	3	10	1	4	3	42
1839,	9	3	5	7	8	2	2	6	6	5	3	1	57
1840,	6	5	7	10	9	3	3	9	5	6	5	5	73
1841,	2	17	9	6	5	2	8	12	5	5	6	1	73
1842,	3	3	2	6	.....	3	6	1	3	2	4	2	35
1843,	4	8	5	8	3	7	7	3	6	5	.....	.....	56
1844,	1	1	5	3	5	1	1	1	4	3	4	1	30
1845,	3	3	.....	3	1	.....	3	5	2	2	1	1	24
1846,	2	.....	1	5	9	2	3	6	8	5	2	4	47
1847,	2	1	9	7	3	1	3	3	3	2	8	4	46
1848,	8	12	8	9	3	3	6	5	1	7	6	5	73
1849,	4	8	8	8	.....	5	6	5	12	10	1	6	73
1850,	1	7	9	5	7	7	9	14	13	8	4	6	90
Total,	76	86	106	125	83	79	100	122	131	110	74	60	1,152

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This table indicates a progressive increase in the frequency of auroras from December to April, a decrease in May and June, and the greatest frequency in September. The number in different years is found to vary considerably, having been remarkably frequent in 1830, 1840, 1848, 1849 and 1850, and more seldom seen in 1828, 1829, 1832, 1835, 1844 and 1845. In the work quoted at the beginning of this article, there is given a comparative list of days on which auroras were simultaneously observed at numerous places besides the State of New-York, and the facts thus collated, show, in a remarkable manner, the truth of the statement that has often been made, that conditions favorable to the formation of auroras may simultaneously exist over an immense area, and that they may appear at places thousands of miles apart at the same moment.

Auroras were noticed on the same days in this State and in Europe on 160 occasions, and if special observations has been made, and clouds had not prevented them from being visible, the number would, without doubt, have been found much greater. Auroras are more common in the north part of the State, and at times they have appeared with a magnificence and splendor beyond the power of language to describe or pencil to paint; glowing with scarlet and crimson hues, and covering the heavens with a drapery of dazzling splendor. The appearance of the aurora may be classified as follows:

1. A steady glow on the northern horizon, like the dawn of morning.

2. A more elevated and diffused light, like an arch with a dark segment beneath.

3. Detached masses of light, often flashing and flickering.

4. Streams, usually springing up from an arch, but sometimes starting up in space with a rapid vertical motion, and often with a lateral one.

5. Coronæ of converging streamers in the magnetic zenith.

6. Bands of light shooting up from the east and west to the zenith, often with a serpentine motion, or appearing to be composed of bundles of rays transverse or oblique to the direction of the arch. These bands usually subside slowly towards the south, and at times form a southern arch.

7. Curtains of light, slowly waving like a flag, at times appearing in a series of several, and at other times single; occasionally extended in right lines to immense distances, but commonly more or less curved, or encircling the zenith. This

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last appearance, as observed by the writer on Sept. 6, 1851, presented a spectacle of grandeur without a parallel.

Through the densest light of auroras the stars are readily seen, and even in the dark segment under the arch, proving that neither are clouds. The disturbance in magnetic and electrical conditions that have been noticed to attend auroras, more especially those presenting a flashing and rapid movement, lead to the belief that they may be caused by these agencies, although a knowledge of the manner of their formation, and the general laws which govern them, remain to reward future observation and discovery.

A knowledge of the periodical and secular changes of terrestrial magnetism, from its relation to practical surveying and the boundaries of land, has a direct claim upon our attention, and at an early day the Regents called the attention of their meteorological observers to the importance of carefully ascertaining from time to time the variation of the magnetic needle from the true north. Concise directions were given for ascertaining the azimuth of the magnetic meridian by observations upon the pole star, and about fifty records of this class were reported. In every instance in this State the variation of the needle has been found to be west of north, the amount being greater in the eastern part of the State than at the west, but the rate of decrease as we go westward is far from being uniform.

This variation is known to be subject to daily, annual and secular changes, and the laws by which it is governed can only be determined by long series of observations at numerous places. The line of no variation at present crosses lake Erie, and is travelling slowly westward. The variation has changed at Albany in the space of nineteen years as follows:

1817,....	5°44′ W.	May 5, 1831,.....	6°25′ W.
Augt. 1, 1818,....	5 55	Nov. 5, 1841,.....	6 40
April 24, 1825,....	6 00	Oct. 1, 1834,.....	6 40
Sept. 20, 1828,....	6 18	Oct. 29, 1836,.....	6 47
June, 14, 1830,....	6 18	Nov. 1847,.....	7 35

The extremes of eastern and western variation, and the time required to accomplish a vibration between these extremes, has not yet been determined. The practice of noting the bearings of lines in land surveying by the magnetic needle without reference to its variation from the true meridian, has been a constant source of inconvenience and perplexity, which in-

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creases with the lapse of time between different surveys. The importance of this subject should lead to the determination of the true meridian at one or more places in each county of the State, and its preservation by permanent monuments, at which local surveyors might be able to determine very nearly the variation, for the purpose of noting in their surveys.

The limits of this article will not admit of an account of phenomena of an unusual character, which were at times reported to the Regents, in the course of the observations under consideration, or a classification of the results of the progress of vegetation, and other changes dependant upon the relative lateness or forwardness of the seasons. Of the former were notices of unusual atmospheric refractions, tornadoes, earthquake shocks, destructive floods and storms, and similar striking and unusual phenomena, and of the latter, the foliation and blossoming of plants, ripening of fruits, and other events of similar character, by which we are accustomed to note the progress of the season. These last named are for the most part so intimately related to the temperature, and presence or absence of rains, that a series of tables of the latter would afford a reliable means of determining their character.

It is highly probable that the changes consequent upon clearing up of the forests, and bringing under cultivation a great part of the State within this century, may have produced permanent changes of climate, and varied the mean time of occurrence of various phenomena. The Indian summer appears to be now less distinctly characterised than formerly, and the depth of snow in winter is believed to vary, one year with another, more now than in the days of our fathers. In many sections these changes, so far as affected by local causes, have nearly reached their limit, as no more forests remain to be leveled, and no more marshes to be drained.

By a continued and intelligent concert of observation, we may be able to determine the extent of influence which these artificial changes may have produced, the effect of cultivation in modifying climate, and the peculiarities which physical features may produce in it. When these become known we shall then be able to adapt our cultivation to the climate in such a manner that, although unable to control or modify it, we may profit by a knowledge of existing conditions, and be able to derive the greatest advantages attainable.

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GRASSES AND HERBAGE PLANTS.

BY SANFORD HOWARD.

PRIZE ESSAY.

The grass crop—including under this head the plants used for hay and pasturage—is the most valuable of the crops produced in the United States. It has been estimated that the hay grown in 1855, was 15,000,000 tons, worth $150,000,000. The value of the pasturage is considered of equal amount, making an aggregate of $300,000,000 for the grass crop of a single year.* In the Northern States, the crop is entitled to a prominence far in advance of any other. New-York leads in its production—the census of 1850, crediting her with 3,728,-797 tons, annually. The importance of the crop is therefore sufficiently evident without an elaborate argument.

A knowledge of grasses,—as regards their specific distinctions, the qualities and habits of different species and varieties, their adaptation to different localities and soils, and their relative value for different animals—is therefore a subject which demands the farmer's attention. That it has generally been too much neglected, might be shown by various examples.

The following remarks are not intended as a *treatise*, but are simply designed to furnish a few hints in regard to some of the grasses and other forage plants known in the northern section of the country. Strictly scientific descriptions are not attempted, the leading object being to give suggestions which may be practically useful. It has been deemed important to present reliable statements in regard to species on whose economical value some diversity of opinion has prevailed.

*Gov. Wright's address before the New-York State Agricultural Society, at Elmira.

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AGROSTIS.—Several species of this genus are met with in this country, but the *Agrostis vulgaris*—Red-top, Herds-grass of Pennsylvania—is the only one in general cultivation. Of this there are two varieties, which may be designated as major and minor.

Agrostis vulgaris major.

The *A. vulgaris major* is popularly distinguished as Large Red-top, Western Red-top, and in some sections as Rhode Island or Burden-grass. It grows from a foot to upwards of two feet in height; favors rather moist soils, and will grow better than most cultivated species on cold, wet upland. It is frequently sown with Timothy (Herds-grass of New England), the two species flowering about the same time. It yields a large bulk of hay—rather light in proportion to bulk—and although of inferior quality as a pasture grass, compared with some species, it is readily eaten by cattle and horses, and produces a pretty large and regular growth through the season. Perennial.

The *A. vulgaris minor* is known in the Eastern States as Small Red-top, Fine-top, &c. It appears to correspond to the

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common Agrostis, or Fine Bent-grass, of English authors. The Plymouth colonists doubtless brought it from England.

Agrostis vulgaris minor.

It is more common in the territory of the Old Colony than in any other part of this country. It is there preferred to the Large Red-top, which is less cultivated. It seldom exceeds one foot in height, and the stalks are very slender, but they often stand thickly on the ground. It yields a less bulk of hay than the larger kind, but it is much heavier in proportion to bulk and of better quality, being highly esteemed for feeding working oxen. Its greatest advantage over the large kind, however, is that on *dry soils* it grows better and lives longer. Hence it is the most common grass in the pastures of this section. The two varieties may be readily distinguished—the *major* having a broader and lighter-green leaf, while the leaf of the *minor* is narrow and dark-green. Perennial.

The *Agrostis stolonifera*—Fiorin—is occasionally seen here. It requires a moist soil. Its habit of spreading rapidly by means of numerous stolons or lateral shoots, and the firm net-

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work which it thus forms, would seem to render it a valuable grass for the banks of watercourses, which might thus be protected from washing. Perennial.

Poa pratensis.

Poa.—The most common of this family is the *Poa pratensis*—Spire-grass, June-grass, Kentucky Blue-grass. It abounds from Canada to Virginia and Kentucky, and probably in more southern sections, though this is the extent of the writer's observation in that direction. It is a hardy grass, springing up in many places without being purposely sown. From this circumstance it is frequently called a *natural* grass, and the "natural pastures," sometimes spoken of in New-York and other states are in a great degree set to this species. But it is not, probably, indigenous to this country. Dr. Darlington regards it as a "naturalized foreigner." It is one of our most valuable grasses, though varying considerably in productiveness in different localities. On tolerably moist and rich land it makes excellent pasturage. It forms the famous "Blue-grass pastures" of Kentucky. The same species occupies the celebrated grazing grounds of Pennsylvania, the Vermont shore

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of Lake Champlain, and other sections noted for good pastures. It starts early in spring and grows late in autumn. In severe drouth its growth is more checked, perhaps, than that of some other species. It throws up but little weight of seed-stalks, its chief value being in its leaves, which in favorable situations grow during the season, and form a thick, dense mass. It is the species relied on for winter pasturage at the South-west. It is but little injured by frost, and a large growth of it may be left on the ground in the fall to be fed off as required. The upper part will get a little whitened, but the main portion will keep bright and fresh. Even as far north as Vermont, this grass, after lying under the snow all winter, is readily eaten by animals in spring, and they thrive on it. Thus a quantity of old grass often enables farmers to turn their stock to pasture sometime before the new grass grows. The species under consideration is highly nutritive, as is proved by the gain of all kinds of stock which feed on it. Dairymen are aware of its superiority for butter-making, and of the superior quality of the butter made from it. On dry, sandy soil, it is not particularly valuable. It makes, in such situations, but a light growth, while the tough sward formed by its roots "binds out" other grasses. Perennial.

The *Poa compressa*—Wire grass—is extensively produced, though it is less common than the preceding species. It is even more hardy than the *pratensis*, and grows where no other grass can grow, as on rocks which have only a slight covering of earth, on steep banks, on gravelly knolls, and under trees. It does not produce a great bulk, but is, perhaps, the most nutritive grass known. All grazing animals eat it with avidity, and sheep are known to fatten faster on it than on any other herbage. Its stems keep green after the seed has ripened, even keep green through winter, and are cropped to the ground whenever animals can get at them. Dr. Darlington says, "cows which feed on it yield the richest milk and finest butter." It shrinks less in drying than any other species, and makes, in proportion to its bulk, the heaviest, and at the same time the best hay, though the yield per acre would not be large. Probably it would not be profitable for hay generally, but for pasture it is valuable, especially from its adaptation to particular situations, as before mentioned. It is sometimes regarded as a pest in grain growing districts, on account of the difficulty of destroying it, the roots retaining life under much exposure

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and with but little moisture. It is easily known by its flat stem and dark-green color. Dr. Darlington suggests that the name "green grass," which in some neighborhoods is applied

Poa compressa.

to the *Poa pratensis*, more properly belongs to the species under consideration—*Poa compressa*—this being much greener in color than the other.

The *Poa serotina*—Fowl meadow-grass, Swamp wire-grass, False red-top—is indigenous to America. Being a species on which there has been some discussion, the following description of it is copied from a paper by J. A. Lapham, in the Transactions of the Wisconsin State Agricultural Society:

"Culm terete slender, bearing narrowly linear leaves, shorter than the internodes, and a long-peduncled, ample panicle; branches mostly in fives, rough, naked at the base, compound above, bearing numerous short-pedicelled, two to four flowered spikelets; glumes lanceolate, sharp-pointed; flowers oblong-lanceolate, acutish, obscurely nerved, hairy only next the base; ligules conspicuous. Perennial; flowers in June and July. Culms two to three feet high. Wet meadows, &c. Wisconsin, Illinois, Ohio, and about Lake Superior. Native also of Europe."

This species, under the name of Fowl-meadow-grass, has been known in some parts of New England for many years.*

* It probably prevails more extensively than has generally been supposed. Prof. Gray, of Cambridge, states that he has seen it on the upper waters of the Mohawk, and in western New-York.

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It is mentioned in "Essays on Field Husbandry," published in 1747. The author, Rev. Dr. Jared Eliot, of Killingworth,

Poa serotina.

Connecticut, calls it by the name just given, but observes that it is "sometimes called Duck-grass, and sometimes Swamp Wire-grass." He says it was supposed to have been "brought into a poor piece of meadow in Dedham, Massachusetts, by ducks and other water-fowl, and therefore called by such an odd name." Of course it is a *swamp* grass, and not suited to arable land. It will live but a short time on soils adapted to grain crops. Neither will it grow on *very* wet land; its proper place is a tolerably well drained bog, or deep and moist alluvion. For such situations it is very valuable, producing a large quantity of good hay. The stalk is long and slender, and like that of its congener, the *Poa compressa*, keeps green after the seed has ripened and fallen. It does not become hard and straw-like by long standing, but is always soft and pliable.

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It is called perennial in Mr. Lapham's description. Its tenacity of life, however, is not great. Farmers who desire to keep up its growth, say it should be allowed to shed its seed occasionally, in order that new plants may be produced.

PHLEUM.—The *Phleum pratense*—Timothy, Herds-grass of New England, Meadow Catstail of England—is extensively cultivated as a hay grass in this country. Sinclair describes two varieties of this species—major and minor—the latter differing from the former "in the dagger-like points which terminate the husks, these being longer and more recurved or bent outwards; the husks longer in every respect, and less ciliated." The larger is the kind commonly grown in the United States, and is too well known to need any further notice.

TRITICUM.—The *Triticum repens*—Witch-grass, Couch-grass, &c.—is well known in many parts of the country, and is commonly regarded as a pest, from the difficulty of destroying it, and the injury it does to other plants by choking their growth. When left to itself it soon monopolises the soil. Yet it will not make a very large crop; it is too thin as it stands and too strawy to give a heavy yield, and where the ground is rich and moist it lodges down and turns yellow before it is fully grown. Stock will eat it pretty well, both as grass and hay. It is a good grass for blowing sands, which are not to be plowed, the strong lateral and perennial roots binding the surface. A committee of an agricultural society in a neighboring State, reported that this is a very valuable grass, and earnestly recommended its cultivation. This is the only instance recollected where its cultivation has been advocated. Dr. Darlington says, "It is desirable to keep our farms as clear of it as possible," a decision in which a large proportion of *good* farmers would readily acquiesce.

LOLIUM.—Under the name of Rye-grass, Ray-grass, &c., various species of this genus have been introduced into this country. The *Lolium perenne*—Perennial Rye-grass—grows from a foot to two feet high; starts very early in spring, but shoots up rather thin and spiry. On warm loams it makes good early pasture for sheep and lambs. It ripens early, about the time of the June-grass (*Poa pratensis*), but does not make as much leaf-herbage as the latter. It does not, by itself, produce a large crop of hay, but the quality appears to be good.

The Italian Rye-grass has lately been introduced here, and has not, perhaps, been thoroughly tried. It is highly recom-

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mended in England and Scotland as being adapted to the soiling system of stock-feeding, and especially as producing a great growth under the application of liquid manure. With this treatment it is said to have been cut five times in a season, producing a crop equal to ten or twelve tons of hay to the acre. In such cases the sward received a liberal supply of liquid manure after each cutting. This species is said to be only biennial.

AVENA.—The species *Avena elatior*—Tall Oat-grass—has been cultivated in some parts of the country. It has sometimes been highly extolled, but has not, on actual trial, supported the claims which some have set up for it. It is a coarse, light, strawy grass, not well relished by any kind of stock, as is proved by its being left in pastures when other species are eaten down. It grows three feet high, but stands thinly on the ground, and its bulk consists almost wholly of long, hollow stems.

FESTUCA.—This genus comprises several valuable species, the most common of which in this country is the *Festuca pratensis*—Meadow Fescue. This abounds on rich old grass-fields in some neighborhoods, although it is seldom purposely sown. It ripens at the same period with the June-grass, and as most cultivated grasses are not at that time sufficiently matured to cut for hay, the Meadow Fescue stands till it sheds its seeds, and thus propagates itself. It is a good early pasture grass,—producing abundance of long leaves and but little weight of stems,—and is readily eaten by stock. It is conspicuous from its glossy-green color. The *Ohio Cultivator* states that this is the "Randall-grass" of Virginia. Perennial.

BROMUS.—The *Bromus secalinus*—Chess, or Cheat—is a well-known pest in most wheat districts of this country. As illustrating the want of correct information on grasses, it may be mentioned that this species has been disseminated in Massachusetts, as a grass of superior value, under the name of "Willard's Bromus." The seed was sold at a high price, and even prominent officers of agricultural societies lent their aid in bringing it into cultivation. Careful experiment has proved that the boasted "Willard's Bromus" is identical with common chess.

DACTYLIS.—The *Dactylis glomerata*—Orchard-grass, Cocksfoot—is considerably cultivated in some parts of the United States, though it does not appear to be as highly esteemed here

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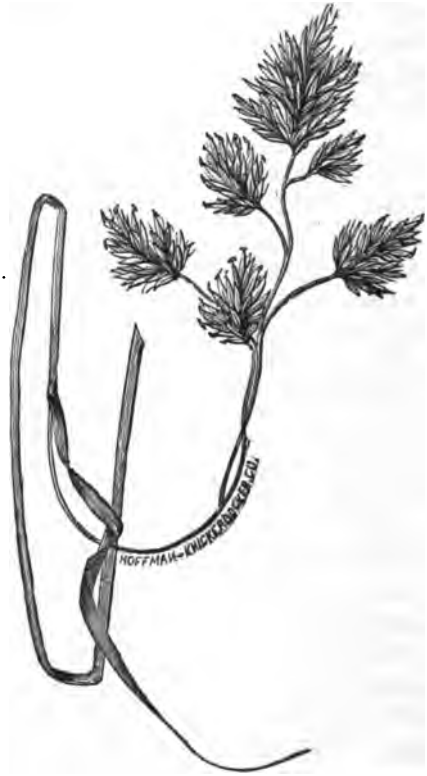
as in its native country—Europe. In some of the Middle States, however, it is preferred to Timothy (*Phleum pratense*) for mixing with clover for hay, as it ripens earlier and at the same period as the kind of clover (*Trifolium medium* ?) there cultivated. But it is not so valuable for hay as for pasturage. When mixed with other plants it stands in tussocks, above the general surface, making the sward uneven and not easy to be mown smoothly. As a permanent meadow grass it is best by itself, and seed enough should be sown to have the plants cover the whole ground and make a thick, even sward. On account of the lightness of the seed, not less than three bushels is required for an acre.



Dactylis glomerata.

Orchard-grass is well adapted to slaty soils, and will grow on all tolerably dry, friable soils of medium quality. It is very tenacious of life, and when once fairly established will sustain itself a long time. It starts with the first warmth of spring, is less checked by drouth than almost any other species, and

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grows till the ground freezes. As a pasture grass it is highly valuable. It shoots vigorously immediately after being cut or eaten off. It makes but few stems or seed-stalks, but its leaves are numerous, and they grow during the whole season, reaching the length of two feet or more, and forming, when untouched, a thick covering to the ground. Perennial.

ANTHOXANTHUM.—The *Anthoxanthum odoratum*—Sweet-scented Vernal-grass, Vanilla-grass—is quite common in the older settled parts of New England, New-York, and some other sections. It is one of the grasses which "come in," like the June-grass, but it is seldom sown by design. It grows best on moist, cold soils; starts very early, and runs to seed sooner than almost any other species. It makes but little bulk or weight, and that chiefly in seed-stalks. Its growth is trifling except in spring. Its vanilla-like odor is very powerful, and a small quantity of the grass imparts an agreeable smell to hay. It is not much relished by any kind of stock. In pastures where it is found, it is about the last thing eaten—its rejected stalks being everywhere seen. One author has given it a high character, and thinks it is the cause of the fine flavor of the butter made in the neighborhood of Philadelphia. The seed was distributed from the United States Patent office last year, and was sent into some neighborhoods where there was already more of the grass than farmers wanted who knew what it really was. The "Complete Grazier" says, "It is certain that cattle will not eat it when they can get at other grasses." Sinclair, in his account of the Woburn experiments on grasses, says of this species: "It does not appear to be particularly liked by cattle." He relates that a farmer sowed a field partly with the Sweet-scented Vernal-grass and White Clover, and partly with Foxtail (*Alopecurus pratensis*) and Red Clover. It was pastured with sheep. He says:

"The sheep would not touch the Sweet-scented Vernal-grass and White Clover, but kept constantly on the Foxtail. . . . This would indicate that the former is not, when single, or when combined with but two or three different species, very grateful to cattle. The chemical examination of its nutritive matter shows that *it does not abound in saccharine matter*, but chiefly in mucilage; and the insoluble extract is in a greater proportion than in many other grasses."

Dr. Darlington, in his "Agricultural Botany," says of this species, "It is by no means regarded in the United States as a grass of superior value." In a letter to the writer of this paper, Dr. D. says: "You will see that I do not estimate the *Anthoxanthum odoratum* very highly. I consider it much in-

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ferior to *Phleum pratense*, *Poa pratensis*, *Dactylis glomerata*, or even *Lolium perenne*, either for *hay* or *pasture*."

Dr. Darlington's residence is Westchester, Pa., the center of a district which produces some of the best "Philadelphia butter." His superior knowledge of grasses, both botanically and agriculturally, is well known.

PANICUM.—Several species of this genus have been cultivated under the name of *Millet*. The kind called German Millet has been most common, but the Italian is by some considered preferable on account of its greater size, growing to the height of three or four feet, and producing much longer heads than the preceding. Millet was highly recommended several years ago as a substitute for the common grasses in seasons of drouth, but of late years it is much less cultivated. It is thought to be a severe exhauster of the soil, grass not doing well after it, and the quality of the hay it makes is inferior to well-cured green oats, barley or Indian corn. Unless cut before the seed is filled, its stems are hard and stiff, and not liked by stock. Annual.

SORGHUM.—Of this genus, and the closely allied HOLCUS, several species have been introduced from Asia and Africa into the United States. The most common of the former is *Sorghum vulgare*—Indian Millet, Egyptian Corn, Mummy Corn, Dourra, &c.—Of this there are several varieties, differing chiefly in the color of the grain and in the time of ripening. Some of them will mature as far north as 43° in favorable situations. In Oriental countries the seed is used for making bread and for feeding animals. The seed resembles that of common broom-corn except that it sheds its husk. It yields a tolerable product, but has no advantages over our indigenous Indian corn. It has been recommended to be cultivated in this country for *fodder*, but after having been tried for this purpose has been abandoned. It is probably no better than broom-corn. Like many other plants, it comes round occasionally as something *new;* but it has been known in this country for at least fifty years. Annual.

The *Holcus saccharatus*—Chinese Sugar-cane—was introduced into France a few years since, where experiments are now going on with it in reference to its adaptation to the manufacture of sugar. In 1855 some of the seed was brought to the United States, and some specimens of the plant were grown here the same year. The writer of this paper produced a few

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stalks at Dedham, Massachusetts. It has been conjectured that this plant would be valuable here for forage. The few and imperfect trials at present made with it, probably would not justify a positive conclusion in reference to its merits for this purpose. Its stalks are very sweet to the taste, and if cut while they are green and tender, would probably be readily eaten by stock. It resembles broom-corn in appearance, even more closely than does *Sorghum*. Annual.

FORAGE PLANTS NOT BELONGING TO THE ORDER OF GRASSES.

TRIFOLIUM.—Two species of this genus,—*Trifolium pratense*, red clover, and *Trifolium repens*, white clover,—are common in the United States. Of the former there are two well-defined varieties, usually designated Northern and Southern clover. The former grows to a much greater height than the latter, is much later in ripening, and produces much less seed. The Northern variety has a coarse stalk, and does not make as good hay as the Southern. The latter may be the *T. medium* of English authors. It is cultivated in the Middle States, and sometimes further north. It is sown with Timothy (*Phleum pratense*) and Red-top (*Agrostis vulgaris*) for hay, and though it ripens somewhat earlier than either of those grasses, the combination makes good hay—the better, perhaps, from the grasses being cut when rather green. It gives a better second crop than Northern clover, and it is from the second crop that seed is generally saved. It makes, by itself, much better hay than the Northern clover, the stalks being smaller and the leaves and heads more numerous. It is somewhat an unsettled question whether either of these kinds is strictly biennial. Some close observers have declared that plants of both varieties have been known to live four years, or more.

Trifolium perenne—Perennial clover, Cow-grass—as described by English authors, has not been observed by the writer in this country. It would probably be valuable in our pastures in connection with grasses.

The *Trifolium repens* is too well known to need particular notice. It is a hardy plant, and abounds in good pastures, combined with *Poa pratensis* and other grasses. A moderate proportion of it gives succulence to the pasturage and adds considerably to the amount of herbage. It is not much cultivated for hay, but sometimes gives a thick bottom to the

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crop, which considerably increases its weight, and is thought to improve the quality. Perennial.

The *Trifolium incarnatum*—Crimson Clover—has been tried in the Northern States in a few instances, but it is not sufficiently hardy. It is said to be a native of Italy.

MEDICAGO.—Of this group, the *Medicago sativa*—Lucerne, Spanish Trefoil, French Clover—is highly valued in some parts of Europe. It has been tried in the United States, but with only indifferent success. The drouth of our summers is too severe for the newly-sown plants; they become choked and weakened by weeds, and of those which survive this season, a great portion generally die the succeeding winter. For these reasons it is not likely to be extensively cultivated in this country. It requires a deep, rich, loamy soil, and if once well rooted there will produce a large amount of herbage, and for a long time, the root being perennial. Of several attempts made by the writer to cultivate it, only one succeeded. In that instance the seed was sown in drills, so far apart that a scuffling hoe could be run between, and the plants thus kept clean from weeds. The soil was a deep alluvion. The plants grew rapidly and were cut three times the first season, being over a foot high at each cutting. The next season they were cut five times, giving an equivalent to a ton and a half of hay to the acre at each cutting. The following spring it was drowned out by a freshet. All grazing animals are very fond of Lucerne, green or dry, and swine and even turkeys and barn-yard fowls eat it heartily while it is tender. Alfalfa Clover from Chili and Mexico, is said, by those who have tried it, to be identical with Lucerne. Perennial.

Medicago lupulina—Black Nonsuch, Trefoil Medick—is a trailing plant not much cultivated in the United States, but is frequently met with along the Hudson and Mohawk rivers, where it was probably introduced by the early Dutch settlers. It is chiefly valuable for pasturage. It is not particular as to soil; it is one of the first plants to grow on stiff clay when it has been exposed to the sun and air; grows in the crevices of slaty rocks, and on steep declivities, where other plants cannot obtain a hold. It makes abundance of seed—the first forming early in the season, the stalks continuing to grow, producing a succession of blossoms and seeds, till autumn. As the seed falls to the ground it produces new plants, so that in the course of the season several generations start up, and the soil is rapidly

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occupied. Horses and cattle are not as fond of it as they are of red or white clover. Sheep eat it readily. Annual.

MELILOTUS.—A species of this is well known as Melilot or Sweet Clover. It is not valuable for herbage, as animals are less fond of it than of the true clovers. In some parts of Europe a preparation of the leaves is used in the manufacture of cheese. The Swiss schabzieger ("sap-sago") cheese contains it, and the leaves have been used for this purpose in America. Another species—the *Melilotus leucanthemum major*—is the Bokhara, or Tree Clover, which was highly extolled several years since. Its cultivation was attempted both in England and the United States; but was abandoned. It is a coarse plant, much like the common Sweet Clover. Annual.

HEDYSARUM.---The species *Hedysarum onobrychis*---Sainfoin, St. Foin---has long been esteemed in Europe as one of the most valuable herbage plants. Many attempts to introduce it into this country have failed from the seed not germinating. Seed of two varieties, however, was distributed from the Patent Office last year, from which plants have been produced. It is to be hoped that it will receive a fair trial here. It succeeds well in England on the "stone-brash" and limestone land. It should be tried in this country on slaty as well as calcareous soils. It yields a large crop, valuable either for pasturage or hay. The root is perennial, and on genial soils is said to continue in productiveness for twenty years, or more.

NOTE.—No reference has been made in the foregoing remarks, to the relative nutriment of different plants, according to chemical analysis, because no data were at hand on which to base such a comparison. The rules adopted by Sinclair (*Hortus Gramineus Woburnensis*) are known to be fallacious in some important points.

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DRAINING.

PREMIUM $20.—*T. C. Maxwell & Brothers.*

GENEVA, ONTARIO Co., N. Y., *January* 28, 1856.

B. P. JOHNSON, ESQ.:

Dear Sir—Below we hand you a statement of our experiment in draining for 1855. The quantity of land drained was forty acres, using over forty thousand tiles.

The face of the land is beautifully undulating, and the soil is a *clay and gravel loam.* About twelve or fourteen acres of this land is somewhat lower than the land adjoining it, and the clay so far predominates that, previous to draining, it was quite impracticable to plow or cultivate it in a wet time, and consequently it was quite difficult to get in a spring crop in season, and for winter crops *it heaved so badly* as to *ruin the crop in many places;* and then in a dry time, or in midsummer, it baked and cracked very badly, so that on the whole it produced *but poorly.* The balance of the forty acres is a lighter soil, and consequently less liable to bake, but owing to the nature of the subsoil was quite springy.

The subsoil is clay, but not impervious, having a mixture of sand in it, and in places a more liberal mixture of gravel, running through in streaks.

We adopted the "frequent or thorough system," laying the main and sub-main drains through the lowest ground, and extending the collaterals parallel, two rods apart, up the slopes, according to Mr. Munn's diagram, in his "Practical Land Drainer," page 55, fig. 14.

We cut our drains two and a half feet deep with common spades, making the bottom of the drain the width of a common hoe blade, with which we remove all loose dirt, and level for the tile, which are two-inch pipe with soles. The tile are

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then laid in the center of the drain, with three field stones—one on each side, and one on the top of each joint. The connections between the main and small drains are carefully guarded with flat stones. For the main drains we use four and six-inch horseshoe tile, and in one instance we use two four-inch and one six-inch; the four-inch together, and the six-inch above and between the others.

We were careful to break joints, and guard them well with small stone. A short drain, laid two years since in this manner, is in perfect order, and works to our satisfaction.

The nature of the tile being rough and gritty, and the pressure of the soil being so equal on the sides, with care in selecting straight, *well-burned* tile, and great care in putting down, we think, for a short drain, where a very large quantity of water is to be carried off, *this is practicable.*

As to the expense, we would say, we have paid twelve and a half cents per rod for opening; our month men lay the tile; two men, one to lay the tile and one to hand stones and cover lightly, will put down fifty rods per day, which we call four cents per rod; then with a long double-tree we plow in the balance of the earth, at an expense of not over one and a half cents per rod. The average cost of tile, large and small, and hauling, is about fifteen cents per rod—total, thirty-three cents per rod.

As to the result, permit us to say, that in our opinion our land is worth more than double what it was before, *for all practical purposes.* We followed the draining with *deep plowing*, and now we have as mellow and productive land as one can ask for. We can cultivate immediately after rains with advantage.

T. C. MAXWELL & BRO'S.

DRAINING AND RECLAIMING SWAMPS.

PREMIUM $10.—*William Johnson.*

ELMWOOD FARM, NEAR GENEVA,
January 8, 1856.

B. P. JOHNSON, ESQ., *Secretary:*

I have on my farm about eighteen acres of flat low land being a sort of a basin for the deposit of the water running

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from a large tract of surrounding lands. The soil is a kind of vegetable mold interspersed with clay, with a clay subsoil. Ten years ago I purchased the farm on which I now reside. At that time this piece was overgrown with small trees, bushes, willows, bog-grass, &c., presenting a most unsightly appearance, and was considered almost a nuisance, in fact it was known and pointed out as *the swamp*. The spring after I came in possession of it I cut down all the trees and bushes, burned them, together with a large quantity of old logs, tree tops, &c., then dug an open ditch two and a half feet deep through the lowest part of it, which carried off a considerable portion of the *surface* water, and was really a great improvement, but was not what the land required, (nor what I intended to do as soon as more pressing improvements were disposed of,) it being a rough uneven piece, full of holes, with a close tenacious subsoil, the water standing in the low places a considerable portion of the year, and of course too wet to be tilled with any success. Last spring I commenced the work of underdraining it in earnest, by cutting a ditch along the east and lowest side of the lot for a *main drain*, thirty inches deep, to be laid with six inch tile. I then commenced on the north and lowest end of the lot with the cross drains, making them about thirty-two feet apart, (varying a little according to the situation of the surface,) nearly at right angles with and entering into the main drain. Now for the *result*—as the drains progressed the water began to disappear from the surface, and within about one week after the drains were dug the water *entirely* disappeared from the *lowest* places. The effect was striking and remarkable to every one who witnessed it. That portion through which the drains had been cut being entirely dry, whilst the other portion immediately adjoining, was literally soaked in water, and as fast as the drains progressed the water would as rapidly disappear. The experiment has proved *entirely* satisfactory, and I have already plowed about one third of the lot and intend to plant the whole of it to *corn* next spring; in fact I expect after it shall have been thoroughly tilled it will be one of the *driest* lots on the farm, and if the season proves favorable, I have no doubt the corn crop will tell well next year.

The actual amount expended in draining the nine acres described above is $234.20-100—showing the whole expense to be about $26 per acre, the items of which are given below:

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To digging 630 rods drains, at 12c.,	$75 60
do 42 rods main drain, at 14c.,	5 88
To 588 six inch tile, at $18 per 1,000,	10 58
1,680 two inch pipe tile, at $12.50 per 1,000,	21 00
7,560 one and a half inch pipe tile, at $9 per 1,000,	68 04
To drawing 588 six inch tile,	2 00
do 1,680 two inch pipe tile,	2 50
do 7,560 one and a half inch pipe tile,	11 00
To 400 feet of lumber for bottom of main drain,	4 00
leveling bottom and laying tile 672 rods, at 2c. per rod,	13 44
filling same, 3c. per rod,	20 16
	$234 20

The cost per rod of the different sized drains, with the *items*, are given below—the difference in the cost being chiefly, the difference between the price of *large* or *small* tile, viz:

Five hundred and eighty-eight six inch tile,	$10 58
Digging forty-two rods, 14c. per rod,	5 88
Laying and filling same,	2 10
Drawing tile,	2 00
Lumber for bottom,	4 00
Tolal expense, (or 58½ cts. per rod,)	$24 56

Two inch tile.

One thousand six hundred and eighty two inch tile, at $12.50 per thousand,	$21 00
Digging 120 rods, at 12c.,	14 40
Laying and covering tile, 5c.,	6 00
Drawing tile,	2 50
Total, (or 36½c. per rod,)	$43 90

* * * *

One and a half inch tile.

Seventy-five thousand and sixty one and a half inch tile, at $9.00 per thousand,	$68 04
Digging 510 rods, at 12c.,	61 20
Laying and covering same,	25 50
Drawing tile,	11 00
Total, (or about 32½c. per rod,)	$165 74

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Thus I have given a correct history of the above, hoping that it may be the means of inducing my brother farmers to improve some of the waste places on their farms which are now entirely worthless, and when thus improved are the most valuable part of their farms, and would by thus doing add many valuable acres to their farms.

I have endeavored to give the *facts* distinctly, and in such form that I hope you will be able to understand them.

WILLIAM JOHNSON.

DRAINING, BY JOHN JOHNSTON.

FAYETTE, SENECA CO.

To the members of the Seneca Co. Agricultural Society:

Gentlemen,—Having nearly finished the underdraining of my farm, in looking back on what I have done during the last seventeen years, having laid during that time over two hundred and ten thousand (210,000) tile, about forty-seven miles, I can see wherein I erred, and should my experience be of service to any of my brother farmers, I will cheerfully give it, believing that thorough draining is the starting point to successful farming.

My first error was in putting too small tile in my main drains and too large tiles in my lateral drains—two inch tile, or even smaller if they can be obtained, is sufficient for all lateral drains. For main drains the owner must judge for himself, from what water there is to carry off. In a number I have two rows of four inch, in a number more I have two rows of six inch, and in one I have semi-circles of eleven inches, one in bottom and one on top, making a circle of nine inch tile to discharge water; in another of one hundred rods, I laid two rows of four inch tile, eight inches apart, and on them I set a nine inch semi-circle, that I find carries a great current of water, and answers my expectations, as all my other drains do. At first I had several to take up more than once, before I could get in tile enough to contain the water. The first important point is to secure a sufficient outlet. I dug almost a canal through part of a neighbor's farm to secure an outlet for drains. The main drains should be from four to six inches deeper than the drains emptying into them—not with an abrupt shoulder

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but levelled up so that the six inches rise may take place gradually in the length of two tiles, with the lateral drains to have a little curve near the end to discharge a little down stream in the main drain. The drains on my farm are from two feet six inches to three feet deep.

I also erred at first in putting too many drains in my low lands, as it very seldom occurs that the low land is naturally wet, but only wet from the upland. If the upland is thoroughly drained, it is seldom indeed that the low land needs more drains than to carry off the water from the upland drains.

For instance, the man without practice in draining a swale, would expect that a drain up the lowest part would drain it; but such is not the case; he must drain the upland adjoining, else he will never make thorough work in draining the swale; in fact the low land can never be made perfect unless the upland is thoroughly drained. My greatest error for some years was in not perfectly draining my upland. I find that I have to reach the summit of the rise or very near it, before I can keep the water underground, and in dry times I have often dug twenty or thirty rods without finding water, knowing that I would reach water near the top of the ridge, and I was never disappointed. The practiced eye will seldom or never fail in finding water where he expects it. My drains are from twenty-seven to forty-five feet apart, generally thirty-three feet, but I have never put in any more than I would do again had I to do it over, and some I would put in more. Nothing but thorough drainage will pay, and I am convinced that money cannot be better expended in any way, than in draining the county of Seneca.

A few years ago when the midge destroyed the most of the wheat, I had six neighbors joining farms with me, and I don't know of any of them, that had over seven bushels per acre, and some not so much as that, and my farm raised between twenty-eight and twenty-nine bushels per acre, and the land being drained was the main cause. Since that time all of my neighbors have drained more or less, and some have very extensively. True it wont do every thing.

I generally fat a number of cattle and sheep, feeding plentifully of corn and oil-cake meal, making rich manure, and applying that to the land keeps up its fertility.

But gentlemen I do not wish you to spend money largely on draining from what I say, but I do wish every farmer in Seneca

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county would thoroughly drain a little, if it was only one acre, and wait the result of that, and I am convinced he would require no urging to drain more.

I commenced under unfavorable circumstances in different ways. First, for want of funds; next, the tile cost double they now do, and digging double; and last though not least, public opinion was very much against me. Some would ask me if I was going to put crockery over all my farm? Some would tell me they thought my farm was rather too dry if any thing; and some of my own countrymen would give me the hint that they had known some men drain and otherwise improve their lands so that they lost them. Even a Judge Cheever, and a Professor Emmons, in a public discussion on agriculture, thought it might be practicable to expend twenty to twenty-four dollars an acre on draining in the humid climate of Great Britain, but thought it questionable if it was prudent for Mr. Johnston to expend so much in this dry climate. I do not pretend these are the exact words, but in substance they were used. As soon as I saw these remarks in the public papers, I answered them through the Albany Cultivator. Both the remarks and my answer, I believe, were copied in the State Agricultural Society's Transactions. Notwithstanding all this, I still felt confident that my draining would end well if I lived, as the excess of two years' crops after draining would pay the cost, and I persevered, and the more I drained the more I was convinced I was right, and I have not been disappointed at the result, as my fondest anticipations have been realised.

If I am spared until next June, I shall have every field drained, but some few fields that I drained some years ago I will put in a few more tiles.

JOHN JOHNSTON,
Chairman Committee on Draining.

October 11, 1855.

EXPERIMENTS IN IRRIGATION.

PREMIUM $20.—*E. C. Bliss, Westfield, Chautauque County.*

I will endeavor to give my simple method of irrigating a portion of two fields. The first field contains seven and a half acres, and when it came into my possession, three years since,

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part of the field was too poor for meadow, and then under the plow. The soil is a loam, with clay and gravel subsoil. A small brook started at a short distance beyond the field, towards the south-east, and ran through to the north-west corner of the field. Commencing at the brook, ten rods east of the field, I dug a ditch twelve rods in length, two feet deep, and two and a half wide; this brought it about to the south-east corner; then from the end of this ditch I commenced and plowed a deep furrow across the south side of the field, taking care to keep it on a level as much as possible. The field, though pretty level, is a little the highest on the south, consequently I use this drain for irrigating. This ditching drained the old brook, which I filled up and seeded down. The plowed part was sowed to oats, seeding that down also. Since then it has all been retained in meadow. After cutting my grass and oats I then, in the month of September, commenced irrigating my field, which was done by means of spade and hoe, making small dams along my ditch and drain, watching and changing them as was expedient; thus I allow the water to flow through the fall and winter, but in the spring only allow the water on the field for ten or fifteen days, then let it off for a week or so, following this practice until the fore part of June. When wishing to let off the water at any time I have only to remove my dams and the water runs again in its proper channel. In this way I manage to irrigate five acres of my field. The two unirrigated corners are manured. This practice of spring and fall irrigating I have continued for three years with marked benefit. Truly the scale is a small one, nothing to be compared with that practiced by many, still it is such as to give me superior crops of grass. Only cut my grass once, and pasture the remainder of the fall.

The whole expense of ditching, draining and filling up the old brook-course was not over twenty-five dollars. Now, to give you some idea of the benefits, I will state, that when purchased by me, the grass, by good judges, was only estimated at five dollars per acre. The crop of 1854 I did not weigh, but it was thought to pay ten dollars per acre, the yield being much superior to any in the neighborhood, but in 1855 the yield was still better, and for the purpose of testing with accuracy I weighed and sold the hay, although I think the practice of selling from the farm a bad one. The amount of expense and crop, as taken from my farm book, are as follows:

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July 10, 1855,	*Dr.*
To mowing with machine,	$5 00
men's labor,	8 30
interest on land, at $50 per acre,	26 25
team work,	4 50
	$44 05
	Cr.
By 19½ tons hay, at $9 per ton,	$175 50
after feed, or rowen,	13 50
	$189 00
	44 05
	$144 95
Profit per acre,	$19 32

You may think the labor estimate low, but I paid from seventeen to twenty dollars per month, men boarding themselves.

My other field contains fourteen acres, but so located that I irrigate but about four acres. The expense of irrigating this amount is not over two dollars. As a small stream runs by the side of the lane, I built a small sluice across it, then plowed from the sluice about twelve rods into the field, then curved a little and continued on a curve for the purpose of keeping the water as near on a level as possible, that as the furrows filled it would enable me to irrigate and thus benefit my meadow. I have practiced irrigation on this piece for five years, and these few acres before I commenced watering them were no better than the rest of the field, but for the five years it has averaged one fourth more than the rest, and while the rest of the meadow seems running down, and will need the plow, this still yields hay as good as one could wish. It is stout as it can stand, and some, so stout as to lodge down. This may seem a small way of irrigating, but I would gladly pay thrice the expense of the above per acre, to irrigate my whole farm.

The water is let on to this field in September, and shut off about 1st of June. As this brook is small, there is no danger of hurting the crop by continuous running, except in freshet, then only a part is allowed to go to the meadow. The soil of

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this is sandy loam, part clay, and of the other gravelly subsoil, but I saw no material difference in the effect of the water on the different soils, and they were both benefited largely. The condition of this whole field, when I commenced irrigating was considered good, and the water has enhanced its value where used; while the other has been on the retrograde.

I have been turning a large brook, which I purpose to use for irrigating fifteen or twenty acres more, as I think it beneficial for meadows on any soil.

E. C. BLISS.

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PRIZE ESSAY.

A TREATISE ON

PRACTICAL HUSBANDRY.

PART II.

BY WINSLOW C. WATSON.

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PREFACE

The following paper is designed to complete a subject commenced by a Treatise published in the last volume of the Transactions of the New-York State Agricultural Society. The former Essay was appropriated exclusively to the consideration of Tillage, and the present is devoted to the subject of Stock Husbandry. I have intended to form, by the two Essays, a synopsis of a complete system of Practical American Husbandry. I cannot hope to have successfully accomplished so important an object in the narrow scope to which I have been limited, but however inadequate may be the result of my labors, I think no American work upon a similar plan has been produced. The various European publications which comprehend the whole subject of the theory and practice of agriculture, are usually too elaborate for the reading, and too expensive for the means of the common farmer. Many of them embrace so much abstruse science, and are clothed in language so technical, as to seriously detract from their utility to the ordinary reader.

I have endeavored to avoid these objections by arranging my work in a brief and comprehensive form, and by presenting my views in simple and familiar terms. My design has been to aid the operations of the unskilful and inexperienced, not to enunciate any novel theories, or to promulgate any new views or striking discoveries in agriculture. I have intended to escape, as much as possible, all contested points in reference to the comparative merits

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of the different breeds of animals, and whenever this topic has been discussed, it has been my purpose to exhibit a just and impartial view of the claims of each as they are presented by their respective advocates. For this reason I have entirely omitted any remarks on the relative excellence of the various families of horses prominent before the agricultural community, and have but slightly adverted to the controverted questions connected with the several tribes of Neat Cattle.

The article on sheep will be found much more voluminous and minute than any other portion of the treatise. I have been led to this course from the conviction that a provident and judicious management of sheep is less understood, and is more neglected by American breeders than any other department of stock husbandry. The opinions formed by long and careful observation enable me to write on this subject with some degree of confidence and decision.

The experienced farmer will probably discover little in the following Essay original or suggestive to him. I shall be gratified if I am so fortunate as to receive his sanction and approval of the views I have attempted to enforce.

In the preparation of this work I have been guided essentially by the results of my own experience and reflections, but have also carefully investigated every subject through the advantages of a somewhat extensive agricultural library, and have endeavored to concentrate on the various questions of discussion all the intelligence it affords. Among the publications I have consulted with the most attention, and to the authors of which my acknowledgments are especially due, are Stephens' Book of the Farm, Morton's Cyclopedia of Agriculture, and Youatt, and the enlightened pages of our own agricultural journals, particularly those of the Country Gentleman and New England Farmer.

W. C. WATSON.

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NEAT CATTLE.

The term "Native cattle" as used in this country is extremely indefinite. It seems very difficult to mark the line of distinction, and yet few subjects in husbandry have been more earnestly discussed than the relative merits of "Natives" and the various classes of Thorough bred. The former must necessarily have originated from the mingling in a series of years of the various European stocks. We may readily assume that the early immigrants to America, who introduced the first stock, selected for the purpose animals of the choicest qualities. The sagacity and forecast which characterized the measures of these immigrants would naturally lead them to choose the most valuable animals as those best calculated to afford remuneration for the expense and difficulty attending their importation. These animals formed the basis of our Native stock, and being transported from various countries, they of course were derived from different sources, and probably were in most instances among the best of their breed.

The first importation of Neat cattle into New England, was in 1623, and these were rapidly succeeded by the introduction of others into different parts of that district. They were brought from England, and we may infer from the general appearance of a great proportion of the stock that these importations included a large infusion of the Devon blood. In the year 1631, cattle were imported from Denmark to supply the plantations of New Hampshire. These animals were large and chiefly yellow. In some parts of that State they had been preserved as recently as 1820, in their original purity. A breed of cattle bearing this description, which were widely disseminated through New England in the first quarter of this century, had their origin probably in this source. The French at a still earlier date had brought stock from France into their American possessions. At about the same period the Dutch imported cattle from Holland into New Netherlands, and the Swedes into Delaware from Sweden. In the southern states, stock was imported from England, France and Spain.

These various breeds, preserved in some sections with more or less distinctiveness, have gradually been mingled together, by an indiscriminate breeding, and form the elements of our Native stock. A combination of such diversified breeds must necessarily have formed a stock unlike any class that existed

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in the old world. The character of our Neat cattle has been constantly improved by cows which had been selected in Europe for their valuable qualities as milkers, to be used on ship-board and discharged on their arrival in this country. Private individuals occasionally imported choice animals for their own use, but it has only been within the present century and more particularly within the last few years, that the importation of thorough bred stock has become a system and a business.

In 1797, a Shorthorned bull was imported into Dutchess county, New-York. About thirty years ago Stephen Van Rensselaer, with the munificence and public spirit that always distinguished his character, introduced some very superior Shorthorns. This was I believe among the earliest, if not the first, of the importation of these animals with a public object and in reference to their propagation and general diffusion. Since that important epoch in the stock husbandry of the State, many individuals and associations have emulated each other in the introduction and breeding of Devons, Shorthorns, Alderneys, Herefords and Ayrshires. We now possess individuals and herds of these various breeds, which are equal to any in the world, and will favorably compare with either in its native district. I propose to glance briefly at each of these classes and to notice their prominent qualities.

The Devons are esteemed an original breed of English cattle, and have been during several centuries celebrated for their peculiar and valuable properties. The North Devons should not be confounded with the South Devons, which are a distinct and altogether inferior breed. The Devons are remarkable for their great docility and exceeding beauty, in which they are excelled by no other class. The antiquity of this breed is attested by the uniform and inflexible exhibition of the particular characteristics which distinguish them. Their color is a dark chestnut, or rather mahogany, varied sometimes into a blood red. Their horns are large, branching, clear and waxy. A circle usually of a dark orange, encompasses the eye. The hair is curled about the head. The neck is firm and finely proportioned, and has a small dewlap. The forehead should be small and somewhat indented; the nose a light yellow, and a white tuft should mark the extremity of the tail. No other white appears on a pure Devon, except occasionally about the udder and belly. The eye is bright and clear, presenting a

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marked expression of mildness and docility. The ears are small and yellow inside, and the legs and feet small and delicate. The form of the Devon is highly symmetrical, the body round and compactly built, with a wide chest. The hair is fine and silky; the skin soft and flexible, and marked by a yellow tinge. The Devon cow is rather small and an excellent breeder, affording milk *remarkably rich* but deficient in *quantity*. The carcass of the Devon is remarkable for yielding the heaviest proportions in the choicest parts, and less in the more coarse. They are highly esteemed in England for working cattle, owing to their great docility and intelligence, combined with an extraordinary hardiness and activity. As oxen they probably excel every other breed. The Devons are kept easily and on coarse fodder and possess eminently hardy constitutions. They will prosper on thin and scanty pasturage. A few years ago, for the purpose of testing their qualities in feeding, I confined a Devon and a Shorthorn cow in the same stable, subjected them to the same care and keeping, which was ordinary fodder. The former fattened, while the other, although consuming a much greater quantity of food lost flesh to such an extent, that I was constrained to substitute a heavier feed to maintain her condition. The shoulder of the Devon is a very distinguishing feature of the breed. It is sloping, not projecting or angular, but delicately formed and rising a little higher than the back. These general properties and marks distinguish both sexes, although the bull should exhibit somewhat coarser and more decided or masculine qualities.

Shorthorns, or Durhams.—Without opening the discussion which has prevailed in this country as well as Great Britain, in regard to the origin of the Shorthorns, it is sufficient to remark that the Shorthorn is an ancient and established breed.

A family of animals appear occasionally to receive a permanent impress of character from the qualities of an individual. Such has been the influence of the original 'Black Hawk' upon a breed of horses, and such was the effect of the bull 'Hubback' upon the stock of Shorthorn cattle. It is almost indispensable for a breeder of pure Shorthorns to trace their pedigree up to this source.

The Shorthorns are large and are uniformly roan, white, red, or red and white. Although heavy and massive, their forms should be symmetrical. The head is short in proportion to the size of the animal, but should be fine, broad across the

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eyes and tapering to the nose. The muzzle should be of a creamy color, the horns small, waxy at the end and curving; the ears rather large, the chest wide and full, and the brisket projecting; the barrel round and the ribs nearly circular; the loins and hips wide and level, and the back broad and expanded. These parts should form almost a straight line from the neck to the setting on of the tail. A curve of the back, which is developed in some herds of this stock, is a great defect. The tail should be somewhat flattened but fine in its cords; the legs should be short and straight with a fine bone. The hind quarter is inclined to be disproportionately heavy, and occasionally impairs the beauty of an animal when fat, by presenting a protuberance that projects beyond the root of the tail. The eye should be prominent, but placid. The carriage of so massive a creature should be bold and lofty. The touch should be fine and mellow and the hair plentiful, soft and mossy, with a hide not too thick and in fact somewhat approaching the feeling of velvet. The neck should be rather short, but full and heavy; the udder soft and pliable with a thin skin, spreading forward and large and full, with the teats far asunder. These are, I believe, the prominent distinctive features of this breed. They are probably being more widely disseminated in this country than any other thorough bred stock. Much controversy exists relative to their qualities as milkers. I think the better opinion to be that the yield of milk is large, but whether it is extraordinary in proportion to their great consumption of food, both in summer and winter, may perhaps be questioned. In comparison with the Devons, I consider the Shorthorns to be extravagant feeders, even in reference to their great size. They require and are only adapted for the most luxuriant pasturage, where their appetite can be satisfied with slight locomotion. Hence they are not appropriate to hilly and rocky districts, or those in which thin and light pastures prevail.

It is claimed for the Shorthorns that they take on fat readily, and at a very early age; that they are gentle and docile and easily restrained; serviceable in the yoke, and make strong and powerful oxen, although not as active as the Devons.

Herefords.—This is an ancient breed of cattle, which has been held in high estimation. They maintained for a long time a closely contested rivalry with the Shorthorns, and many Hereford breeders still assert their equality with any other breed. The Here-

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fords are large, but more delicately formed than their rivals, and Stephens remarks that "it is generally conceded that they are not equal to the Shorthorns as milkers." The Herefords are usually red, with white stripes about the back and neck, and almost uniformly have white faces. The exceptions are when the faces are brockled. In the form of the head they very much resemble the Devons, but are not so delicate about the muzzle. Their necks are large, and inclined to a throatiness, but taper delicately towards the head. The hair is rather long, and is soft and wavy. The horns are spreading, tending upwards and outward, and are clear and yellowish, or white, with a dark termination. The hind quarters of the Herefords are generally very fine, except in some cases they have too much thinness of the thighs. The shoulders are finely set on, and raised a little above the level of the back. The chest is expanded, but the ribs do not essentially curve. The skin is not thin, and the handling should be mellow but firm. The Hereford wants the docile and placid eye of the Devon, and still they more assimilate to them under the yoke than any other breed. The Herefords make excellent beef, but the authority I have just cited pronounces them unequal to the Shorthorns as feeders. No correct eye can look upon a fine Hereford without admiring his beautiful proportions and stately carriage. In England this breed is chiefly cultivated for the shambles, and must be peculiarly fitted to the remote districts of our own country, which do not enjoy a ready access to market for their dairy products.

Ayrshires.—This breed originated, and now predominates in, a district in Scotland of that name. Bred in a cold and rigorous climate they are hardy in constitution, scant feeders, and capable of great endurance in the changes of weather and seasons. Unlike the Hereford, they are not distinguished for their fattening properties, but are mainly cherished for their remarkable capacities as milkers. Such is the great reputation of the Ayrshires for their milking qualities, that they are generally selected by the affluent in England and Scotland for their amateur dairies. The Ayrshires are rather small, but handsomely formed. They are commonly red and white in distinct spots; sometimes red, and occasional yellow or dun spots appear. I have seen them spotted by a dark chestnut. Stephens says they are red and white, and sometimes entire red, but never white, and Morton alludes to their being sometimes spotted black. The points considered good in an Ayrshire bull are these: "a broad and short head, the horns spreading from the side a little in front, and turning upward; the top of the

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shoulders sharp, and the back rather narrow and rounded over the ribs, which are rather flat; hams thin, tail-head somewhat drooping, belly enlarged and legs very short. These are all points opposed to those of a good Shorthorn, and the points in which they agree are, a straight back, loose mellow skin, large eye, sharp muzzle and small horn."—Stephens. The udder of the Ayrshire should be white and large, standing far forward and showing largely behind; the teats should be of moderate size, and set far forward. The eye is gentle, but not large, the ear of good size, and within of an orange hue, the neck is of medium length, delicate and tapering; the skin is rather thick, but handles softly. The Ayrshires are not inclined to take on flesh, but as the popular phrase is, "run to milk." When dried off the cows make medium beef, but are not in great request in England by the drovers. As oxen they are docile and active, but deficient in size.

I have not had the gratification of any personal experience with the Ayrshires, but from their reputation in books and their traditions I regard them as occupying the first position as a dairy stock, and pre-eminently adapted for this object, to the more elevated and colder districts of this country, which are the most analogous to the soil and climate of their native hills. They are peculiarly calculated for broken and hilly ranges and no cattle prosper so perfectly on thin and coarse pasturage.

Alderney, or Jersey.—This breed has a close conformity in many characteristics to the Ayrshires. They differ in their milking properties, in this peculiarity,—while the latter are remarkable for the quantity of milk they yield, the former are valuable for the quality rather than abundance of their milk. The Alderneys are of French or Norman origin and although little cultivated in this country, seem worthy from their singular properties of particular notice. They are small and far from being attractive in their appearance; are usually light red, yellow, dun or fawn colored. They have crumpled horns, are small boned, but coarsely and irregularly built. Some authors call them "deer necked," and refer to a general resemblance in form to that animal. This breed is esteemed among the best milkers, in reference to the quality of their milk. The only beauty ascribed to the Jersey cow is her finely formed and tapering head, and capacious udder. The additional prominent points required of this breed in England, are a broad forehead, small cheeks, ears deep orange within, clean throat

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muzzle fine and encircled by a light color; horns smooth, crumpled, tapering and tipped with black; chest broad and deep, barrel hooped and broad, well ribbed and a small space between ribs and hip; back straight from wither to hip and from hip to root of tail; tail fine and large and set at right angles with the back; hide mellow and movable, but not too coarse; legs short and straight; hind quarters from the hock to the point of the rump, long and well filled up; hind legs not too close.—Morton. The specimens of the Jersey cow in this country do not I think accurately conform to these requirements. This stock has been long conspicuous and bred with great care. It was formerly supposed that the milk of the Alderney was too rich to produce cheese, but experience has proved the fallacy of this idea.

Some writers pronounce them to be worthless for grazing, while others assert that after being dried they fatten rapidly and afford most excellent beef.

The Galloway, as the name implies, is of Scotch origin. They were much more prevalent in this country thirty years ago than at present. They are hornless, and singularly docile and quiet. They may be more safely herded in yards than other breeds from the absence of horns. Many farmers are prejudiced against them on account of this peculiarity, believing that it facilitates the throwing of fences and other mischievous propensities. The Galloways are of a medium size and usually of a dun, cream or fawn color, with hair soft and curly, and a hide rather thick, but mellow and covered by a rich creamy tint. These cattle are highly esteemed for grazing, and although the milk they yield is not abundant it is remarkable for its peculiar richness. I possessed more than twenty years ago a Galloway cow, apparently of great pureness of blood, which I found so valuable and extraordinary for her milking properties, that I still retain her stock, although no longer hornless, they are yet distinguished for the richness and high creamy color of their milk.

The Galloway cattle of the present day, in Scotland, are mostly black, though duns are not uncommon. For the shambles they are very valuable, and are fattened with great profit on the rich farms in England.

Mr. Johnson, the Secretary of the State Agricultural Society, since his return from Europe, has earnestly called the public attention to the "Black Cattle" of Scotland. I feel, from his re-

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presentations, and relying upon his well-known sagacity and discrimination, that this hardy breed would be a great acquisition to our grazing stock, and have hoped that some of our opulent and public spirited farmers would be instrumental in their introduction into this country. The enterprise would be of great national utility, and doubtless remunerative to themselves. Individuals of this breed have been introduced into Canada, and from that source it is hoped they may reach us.

Breeding and Crossing.—The Shorthorns are a striking illustration of the utility of careful and judicious breeding. They demonstrate the important results which may be attained by skill and perseverance. The male undoubtedly exerts the most potent influence in impressing character upon the progeny, particularly in reference to size and form, but much also in its qualities is derived from the mother. The bull should possess the peculiarities of his breed in the most marked and decisive character. In addition to these, he should be bold, sprightly and vigorous. The most suitable age of a bull for procreation is from one to three years. During this period he possesses his full vigor and energies. Farmers generally consider a yearling bull the most sure to impregnate, when used with a limited number of cows. After three years bulls become less certain, and are often unmanageable and dangerous, but castrated at this age they fatten readily, and make tender and excellent beef. Circumstances may of course render this management inexpedient. As a governing rule, it is advisable to breed from individuals as remotely related as possible. If necessity or choice lead to the adoption of the "in and in" system of breeding, it is well to observe some general considerations, and among these the following may be esteemed the most important. If the family is remarkable for any peculiar excellence, the individuals used should have these properties in an eminent degree, but if any inferior qualities mark the race, vigilance must be exerted to avoid breeding from animals, both of which may be impressed with these traits, and this caution should be applied with greater force where any hereditary defect or disease exists. In the first case supposed, the valuable qualities may be confirmed, and even improved, but in the last the defects will be augmented, and enduringly impressed on the stock.

The various breeds which have been described may be crossed in reference to some specific object, with great advantage, but it is very desirable not to follow the practice into a promiscuous intercourse; neither is it wise to lose, from a want of care,

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purity of blood, but this should always be preserved as a point of departure in breeding. The Natives may be vastly improved by crossing with any of the thorough-breds, regard being always had in the selection to the object contemplated; whether it be to advance the quality or quantity of milk, the size or beauty of the animal or its grazing and fattening properties. The cross should be chosen with a view to these purposes. Some of the most beautiful cattle I have ever seen, were crosses between the Devons and Shorthorns, where the beauty in color and delicacy of the former combined with the size, form and grazing qualities of the latter. It is stated that the fattening properties of the Ayrshires have been greatly improved by a crossing with the Shorthorns, and in the richness of their milk by the blood of the Alderneys. I have no doubt but that a cross of either the Ayrshires or Alderneys would be of the utmost value to our common dairy stock.

It is surprizing with what tenacity some farmers adhere to old prejudices, and because they occasionally have a superior calf from the promiscuous intercourse of their cattle, reject all theory on this subject and refuse to apply the most effectual means for the improvement of their stock. It is very true that "a good cow may have a bad calf," but it is equally certain when a tribe of animals has in a series of years been conspicuous for some particular qualities of excellence, which have become hereditary, that the probabilities are in favor of these properties being transmitted to other breeds by judicious crosses.

In reference to the size and form, it is generally advisable to cross a bull of a smaller breed with a cow from a large stock. Symmetry and a full muscular development is more certainly secured by this system.

In concluding this branch of my subject, I may recur with propriety to some considerations which I have already incidentally noticed. In selecting stock for breeding, regard should be had to size, form, hardiness, early maturity, milking qualities, fattening and flesh, hide, and aptitude to labor. An ideality which would combine all these points in superior excellence, cannot probably be realized, but an approximation should be embraced in the designs of the breeder. The general points, modified however somewhat by the breed, which should be required in the selection of choice animals are, exact and sym-

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metrical proportions; the head finely and compactly formed, not disproportionately large or long, the neck of medium size, not large but tapering towards the head, and not heavily united to it; the chest round, full and capacious; the legs adapted to the size, but never disproportionate in length; the bones clear and small; the feet small and round; the back and loins straight and in most breeds broad; the belly firm and full; the quarters deep and full, and the eye placid, bright and prominent. Long bony and ill formed legs supporting a thin and contracted body, is not only a repulsive sight to an accurate eye, but in Neat cattle is proof of the absence of many desirable qualities. In making a selection primarily for grazing, those individuals or breeds should be preferred which promise "to weigh the most in the most valuable joints."

Much discussion has existed among breeders as to the claims to preference of large or small animals. This question not only refers to the various breeds but to different members of the same family. As a general fact it may be assumed that large sized animals have the largest and coarsest bones. They require more luxuriant feed and a longer period for grazing; and on grass I think they will not so amply fatten as small cattle, and require higher subsequent feeding to acquire an equal degree of fatness. In the Native stock it is I believe commonly conceded that small cattle afford the most delicate and sweetest meat. The augmented muscular development in large cattle must tend it would seem to render the flesh less delicate and coarser. In the dairy I have no hesitation in stating that it is far from usual that the largest cow yields the greatest product of milk. It need scarcely be remarked that animals are thought to consume fodder in proportion to their weight.

Hardiness of constitution is another most important consideration not only in selecting, but also in retaining stock. Those possessing this quality are kept at a less expense and risk, and will always thrive better and take on flesh more rapidly. Breed and rearing have much influence in forming character in this respect, and many breeders suppose coarseness of hair and dark colors indicative of hardiness. When experience admonishes us that an animal possesses a feeble constitution, it is always wiser and safer to turn it off promptly, unless some peculiar circumstance or excellence creates an exception. Early maturity and aptitude to take on fat are highly essential requisites for grazing.

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I have frequently alluded to the hide as furnishing evidence of the breed and qualities of an animal. A soft, silky and pliable skin affords favorable indication of aptness to take on fat. A thick hide is however useful in cold districts, and in some most valuable breeds acclimated to rigorous latitudes it predominates and is not objectionable in such stock when it is loose and flexible. Thick hides weigh heaviest and are in great request for some particular kinds of leather.

Horns large, heavy and clumsy, alike impair the beauty of an animal and are unfavorable evidences of milking and fattening properties. The quality of both summer and winter feed of a farm should be taken into account in deciding on the selection of stock; for one breed will thrive and fatten where another would waste and grow poor.

Cows.—The points not noticed already of a good dairy cow, are a deep body, hips wide apart, the udder soft, flexible and large, although the last quality if it is produced by a mere accumulation of flesh is usually an unfavorable mark; the teats should be of medium size and well apart; the eye should afford evidence of a kind and docile temperament; the bag should extend forward and be fully developed behind, and the legs fine boned, well turned and short.

The most favorable age for heifers to come in is at three years old. They are then sufficiently matured to prevent their size or constitution being impaired by breeding. The opinion however has many advocates that they make better milkers by coming in a year earlier, and that by this practice the lacteal vessels are expanded and invigorated and a future greater supply of milk secured. When heifers come in at this age I think it advisable to preserve them farrow the succeeding year. By this management the benefits supposed to result from early breeding may be attained, and being farrow for a season gives them an opportunity of recovering from any injurious effects of gestation.

The period of pregnancy in a cow is about nine months. Old cows frequently overrun this term, and it is the popular belief, confirmed I think by observation, that those carrying bull calves also exceed it. Dairy cows in this latitude should calve about the 1st of May. The fœtus quickens in four or five months, and pregnancy may be ascertained in various ways. If the fingers be pressed into the right flank of the cow, a hard lump will be perceived if she is pregnant; or give her a pail of cold water and immediately place the hand upon the body between the flank and

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udder and the motion of the fœtus will be distinctly felt. The pulsation of its heart may also be heard by pressing the ear closely to the cow's side near the flank. The conclusion will almost uniformly be safe that the cow is pregnant if she does not a second time at the natural period desire the bull.

The symptoms of approaching calving should be carefully watched; these are indicated by the enlargement and increased tenderness of the udder, the milk veins become swollen, the vagina florid, flabby and loose, and the skin between it and the udder of a reddish hue, and the muscles on each side of the rump are relaxed and drop down. With heifers these signs are not so positive, as they are exhibited and disappear, especially the swelling of the bag, several times before parturition. A record should be kept on every stock farm, in order that the time of calving of each cow may be known as nearly as possible.

Cows are very prone to the slinking or slipping of their calves. This consequence is generally produced by accidents or exposure to loathsome objects or odors. The sense of smelling in cows is exceedingly acute, and hence, when an abortion takes place, not only the calf but every incident of parturition should be speedily removed, and the cow herself should be separated from the herd. When this accident occurs it is apt to extend to other cows, rather, I think, from sympathy than infection, unless these precautions are taken. A cow which has met with this catastrophe is generally injured in her milking properties, and is liable to a recurrence of the same accident, and under ordinary circumstances it is always expedient to fatten her. If symptoms of slinking appear, which are a sudden and unnatural swelling of the udder, an untimely looseness and redness about the vagina, and a yellowish discharge from it, the cow should be bled, and light laxative and sedative medicine be administered, but they seldom avail.

The parturitions of cows are generally safe, but they should not be allowed, when the period approaches, to wander away and secrete themselves, as they often require assistance, and should always be watched. The following is the natural position of the calf at the birth: the fore feet in front, the nose between the fore legs, and the back towards that of the cow. If only one leg is presented, or the head without the legs, let the hind quarters of the cow be elevated by some straw or otherwise, then, when the throes are off, gently insert the hand and draw out the feet in the proper position. Sometimes the hind legs are presented, which is attended with little danger, but this presentation may require as-

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sistance by pulling steadily and gently on the legs while the cow is straining. The presentation of the shoulders or back is much more alarming, and is very difficult to overcome, as delivery can only be accomplished by pushing back the calf as in the preceding case, and bringing forward the legs. The effort to do this is apt to excite the pains, and while her throes are on the attempt is utterly impracticable. I once lost a valuable heifer under these circumstances, when the united strength of four men was totally unavailing against the force of her straining.

The operation is the more difficult the longer the labor has been protracted, but upon its success alone depends the safety of both the cow and calf. Sometimes when this presentation occurs, or the head is enlarged by dropsy or otherwise, the neck of the calf may be severed, and the body extracted in pieces, but this is a very delicate and critical process, and should never be attempted by an unskillful hand. If the calf is dead, or too large for a natural birth, it may be extracted by securing a cord or hook to some firm part. The hook, when introduced, should be enclosed in the operator's hand, and managed with great caution, so as not to injure any organ of the cow. Whenever force is necessary to remove the calf, it should be applied while the cow is lying down. One-fourth the force applied in that position will be as effective, when accompanied by her efforts, as would be required if applied while standing.

Another very inconvenient, and often fatal, incident to parturition occurs from the detention of the after birth. This happens the most frequently with cows in low flesh, or those which have had abortions, or have endured an unnatural labor. I have found that a quart or two of rye, boiled to a mucilage, and given daily for a week or ten days before calving, almost uniformly averts this difficulty. Repeated doses of a decoction of slippery elm bark, a quart or more at a time, which may be given in slops, or poured down, will generally cause the discharge of the placenta. It is occasionally fastened to a horn of the womb, when it can only be extracted by inserting the hand up the vagina and separating it.

The most efficient means should be used for its immediate and complete removal, for if suffered to remain it affects for a long time the health of the cow, as well as her milking capacity, and sometimes produces a mortification of the womb and causes frequently the death of the animal. No effort should ever be made to draw away by force the afterbirth, for if it adhere to the calf-bed that organ will necessarily be extracted with it. This is

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frequently cast from natural causes and must be replaced artificially and with great care. It should first be carefully washed and cleansed from all impurities and then gradually and delicately replaced, commencing at the upper extremity. Some operators sprinkle it lightly over with fine pepper, with a view to excite the action of its vessels. It is liable to be again ejected if the cow lies down, unless her hind parts are very much raised, and it is generally advisable to keep her in a standing position for a day or two, either by a swing or watching her. The retention may be aided by passing a small wire or stout thread through the vagina.

A pregnant cow should be carefully guarded from fright or exposure to accident, or injury from blows or kicking, and should never be allowed to flounder in deep mud and snow, or upon the ice. When the period of parturition has arrived she should be confined, in winter to a warm stable, and at other seasons be placed in a situation where she may be carefully watched. Cows are frequently affected towards the termination of pregnancy by inflammatory symptoms and costiveness. Mild laxatives should be applied or vegetable food be given, and if the symptoms do not yield bleeding may be necessary. Cows should not be exposed to a current of cold air or be permitted to drink cold water immediately after calving. A pailful of tepid water, to which may be added a handful or two of meal and a little salt, is sufficient. If she is much exhausted by her labor a little stimulating drink may be given to the cow. In England, ale is much esteemed for this purpose.

The udder sometimes becomes sore and distended before calving. The irritation may usually be allayed by washing it with warm water two or three times, and rubbing it with the hand, or if the symptoms continue, by an application of goose grease. Milk is frequently secreted in considerable quantities before calving, particularly when the cow is at grass. If this occurs, it is safest to remove it, as there may be danger of inflammation and ultimate suppuration of the bag if the milk is allowed to remain. If the calf is unable to withdraw all the contents of the udder, the cow should be milked thoroughly soon after parturition, as the bag never should be allowed to become hard and caked. When this tendency exists the expedients just mentioned should be pursued. I have seen a bag in this condition relieved and softened by gently rubbing it with a small smooth stone just taken cold and damp from the earth.

Milking.—When parturition has been safely accomplished and

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the calf disposed of as we shall notice, the regulation of milking commences. Much experience and skill is required to perform this in a proper manner. Heifers are often shy, have sore teats and tender udders, and must be broken in with kindness and caution. They should be subdued by patience and gentleness and not by harshness and violence. When the former course is pursued, they soon learn to delight in being milked, and come to the pail with docility and pleasure.

The cow should never be hoppled by her hind legs nor have her tail tied, but if in spite of gentle and kind treatment she continues any evil propensities she may be considered incorrigible and should be turned off.

Milking should be performed as rapidly as possible, and the vessels be all thoroughly emptied. If any milk, even a trifling amount remains in the udder, it speedily curdles, sometimes producing inflammation and the most serious diseases, and always causes great injury to the cow by hardening, closing the lacteal ducts, impairing the capacity for secreting milk, and thus rapidly drying up the cow. Many valuable cows are permanently injured by a want of care and efficiency in the performance of this labor.

In milking the left shoulder should be firmly pressed against the flank of the cow, by which means the milker may partially control her movement, and will be admonished of any intended motion of her leg. Regularity in the period of milking should always be observed. A cow should be esteemed rather for the quality than the quantity of milk she yields.

The color and general appearance of the milk usually furnish sufficient evidence on this point. An American author suggests a very simple practical Lactometer which may be successfully used to determine the relative value of cows in this respect. "Take" he says, "a small tumbler, towards the top of which mark distinctly the space of an inch with ten lines at regular distances—fill the glass with fresh milk gently stirred in the pail so as to mingle the whole, fill the tumbler exactly to the inch, allow the cream to form, and then ascertain how many decimal parts of the inch are covered by the cream. In this manner the milk of each cow may be compared, and their relative value decided." This experiment it is scarcely necessary to remark should be made either in different glasses at the same time, or under similar circumstances of weather and temperature.

The teats of cows become sometimes cracked or sore, which occasions exquisite pain to them in milking. The operation can

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only be performed at this time with the utmost gentleness. Carelessness in handling the teat or leaving it damp after milking commonly produces this difficulty.

Stephens recommends an ointment of butter melted and burnt with a slight admixture of tar, as a corrective when teats are thus affected.

In dairies, cows are usually kept from the bull until the month of July or August, although they generally desire him within four or five weeks after calving. When a difficult labor has occurred, or unfavorable symptoms have succeeded parturition, he should not be allowed to approach her until the sexual organs have had ample time to be restored to their natural condition.

The term in which cows will continue to give milk is very materially controlled by the management of heifers on their first calving. By perseverance in milking they may be continued in milk almost, if not entirely, to their second coming in. If they are dried off at an early period a habit is established, which it is difficult, if not impossible, to eradicate. I think it not expedient, however, to milk them within several weeks of their calving. Nature should be allowed a period of rest, and besides, a continuance in their secretion of milk must impair the growth and vigor of the fœtus. In no case should a cow be milked after her bag begins to spring for a succeeding birth.

Some cows have a very annoying habit, which may be excited by various causes, of holding up their milk. If she does not yield for its correction to gentle and patient treatment, she may in most cases be beguiled out of it by allowing her to eat slops while milking. Many supposing she effects her purpose by an action of the muscles near the loin, place while milking a weight, a bag of sand for instance, on that part, which it is believed incapacitates her from executing the necessary movements.

An operation is occasionally performed on cows, called "spaying," which, if successful, causes them to retain a perpetual and full flow of milk. It is performed by cutting a slit in the flank of the animal, inserting the hand through it, and crushing the ovaries in the womb.

The cow should be at least four years old, and in the abundant flow of milk. The operation should be performed three or four weeks after parturition. The only essential prelimi

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naries, it is stated, are, that she should have been kept without food twenty-four hours, and that she be milked immediately preceding the operation.

Calves.—A newly dropped calf is frequently enveloped in a thick and tough membrane, which he is often unable to burst. This becomes hardened and stiff in a protracted labor, and the calf will immediately suffocate in it unless it is opened about the nostrils. If the navel-string bleeds it should be carefully tied up. When the teat is closed by a gummy substance, as sometimes occurs, which the calf has not strength to extract, it must be pressed out. The early secretions in the udder are a yellow mucus, which is a provision of nature to cleanse and invigorate the viscera of the calf. This he must never be deprived of, but any portion which he does not extract should be milked out. These secretions continue until the third or fourth day. Many breeders allow the calf to run with the cow through the summer, and this may be the most natural arrangement for the calf, and under which he will best thrive, but it is attended with more expense than will generally conform to the views of the ordinary farmer, unless there is some peculiar intrinsic value in the animal. The practice, to my mind, has other objections. Few good milkers exist which will not yield much more milk than is sufficient for a single calf, but by this system her secretion of milk will soon become limited to the mere requirements of the calf; the milk vessels will be permanently injured for subsequent milking capacity; and when the calf is taken from her she will be found to have formed such habits in the secretion of milk that she will afterwards possess comparatively small value as a milker. The calf is apt to grow up with wild and vicious propensities, which are subdued, if at all, with great difficulty. I think it far preferable to confine the calf, and allow it to suck at stated periods of the day, or to milk the cow and feed the calf. In this way an ordinary cow can easily rear two calves. When the calf does not exhaust the entire udder, he should be permitted to take the first milk, which is more congenial to him, while the last is most valuable for making butter. A calf fattening for veal should be indulged in all the milk he will take. The most economical mode, and one adequate to common purposes of rearing calves, is to give them new milk exclusively for a few days, and then gradually incorporate with it skimmed milk, till the latter is entirely substituted. If this feed does

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not seem to be sufficiently nutritious, a little Indian, Oat or Barley meal may be mingled with it. This mixture should be scalded. A favorite and quite successful method of feeding calves is to allow the milk to stand twelve hours, then take off the cream and give from four to six quarts of the skimmed milk to the calf.

Linseed and hay may be boiled into tea and given to calves, separately or mixed with skimmed milk. The former should be boiled into a jelly, and when used be mixed with water in the proportion required to give it the proper strength. A handful of the latter boiled until the essence is extracted will be sufficient for a meal. These various drinks when given to the calf should have about the temperature of warm milk.

Calves will commence eating hay or nipping clover when quite young. To gratify this appetite they should be supplied either with fine hay in the stable, or have the range of a small clover pasture. At ten weeks the quantity of their drink may be reduced, and if ordinarily thrifty at three months, they may be turned out to grass. It is not profitable to attempt to raise calves which are dropped later than May. The bull calves should be castrated when about one month old. The operation is very similar to that on lambs, and is quite safe when the animal is in good health. It is advisable to castrate at an early age.

Steers may be wintered with much more safety and ease than bull calves. Calves have a propensity to suck the ears, tails, navels or teats of each other. This is a very pernicious habit to both, and when it occurs they should be restrained by separating them, either by tieing up or placing them in different pens, although the habit may be generally arrested by smearing the parts with some noisome substance. In summer and autumn, calves should at all times have free access to a shed or some other covering, and in winter they should be protected with great care from cold, wind and wet. In autumn they should have the range of the choicest feed, and if they do not sufficiently thrive, should be supplied with a little grain or cut vegetables, as it is of the highest importance that they commence the winter in a vigorous and high condition. Fine well cured hay made of the most nutritious grasses, and a small but regular supply of meal, shorts or vegetables should be given them through the winter. Frequent and thorough examination should be made of calves to ascertain whether they

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are infected with lice, as they will thrive under no treatment while preyed upon by these parasites. Various remedies are used for their destruction. The most simple and effectual one I think, is to rub oil about the eyes and neck along the vertebra, and around the root of the tail. Smearing them with tobacco juice, and washing in warm and strong soapsuds, are also effective antidotes. A string covered with unguentum is sometimes tied closely about the calf's neck for this purpose, and is a very successful remedy; but to avoid accidents from calves sucking the string, they should be kept entirely separate from each other during the application. Calves can readily be made tame and docile by habitual caressing and gentle handling.

Oxen.—Steers at an early age should be accustomed to handling and familiarity. They may be broken to a light yoke when a year old. By this practice they acquire a docility which avoids much subsequent labor and inconvenience, when they are finally brought into work. The prominent qualities which distinguish a good ox, are a large head, a firm and fleshy neck, broad shoulders, a massive frame, firm and well formed, legs rather short in proportion to the size of the body, a placid and animated eye, and an active gait.

Great patience and gentleness should be exercised in breaking steers. Each animal before being yoked, should be tamed and made to understand the language of teaming. This is effected by placing him in a yard and gently soothing and caressing him and encouraging and rewarding docility and obedience by an occasional nubbing of corn. Teach him to haw and gee, and back by the voice and practice. In this process of tuition he should never be alarmed or agitated by harsh blows or by angry and excited tones. He will very soon become familiar and obedient, and the yoke may then with ease and safety be imposed. In matching steers, size, strength and gait should be made to conform rather than color. The largest and most free should be placed on the offside.

When first yoked they should be driven without any other attachment, until they become acquainted with each other and familiar with the driver. After this is effected, attach a chain to the yoke that they may be accustomed to its noise and movement. A light log should next be hitched to the chain and dragged. Afterwards, the burthen should be gradually increased until they are made to know and feel their strength.

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It will be found very convenient, if practicable, to work them at first with a steady well broken yoke of old oxen. Much depends in forming habits of activity, upon the early usage of oxen. Some steers notwithstanding their original promise, prove feeble, or incorrigibly slow or stubborn. When these defects cannot be overcome, the ox will possess little value for working, and should be turned off. An ox should rarely be retained for labor after he is seven or eight years of age. At that period he may be advantageously fattened, but as he grows older he becomes tough and loses his aptness to take on flesh or tallow. Great care should be observed in adjusting the size of the bow to the neck; it should fit closely, but without being tight. There has been great improvement introduced in late years in the construction of the bow and yoke, of which every farmer should avail himself.

Oxen often contract very annoying habits of hauling and crowding. Allowing them to roam yoked in the pasture has a tendency, it is said, to correct this habit. I have also sometimes used with success for this object, a long yoke with the bows placed wide apart.

Many obvious advantages exist for using oxen rather than horses in the exclusive labor of the farm. They are better adapted for breaking up and plowing hard and stony land, and for working in the woods and on miry ground. The disbursement they require is less, equally for their original cost and keeping, and for their necessary gearing. When they have performed their term of service they may be fattened, and they are then more valuable than at any other period, while the horse, after his maturity, rapidly deteriorates, and when old or injured becomes worthless. If, however, activity is required, as in light plowing or dragging old land, horses will perform the work better, and with greater celerity than oxen.

SUMMER MANAGEMENT.

I have noticed in other connections various points which would be appropriate under this head. The season of spring is generally the most perilous for cattle; they are then too often in low flesh, and are apt to be in a feeble condition, while the severe changes of weather, incident to the season, sensibly affect them at this period. They require the most careful attention, and should not be allowed to range without restriction, to wallow through mire, or be exposed to swamps

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or spring holes. I have elsewhere expressed the opinion that it is advisable to accustom stock gradually to the change from dry to green feed, by turning them out early, and supplying by fodder any deficiency which occurs from the scantiness or want of nourishment in the young grass, rather than to confine them exclusively to hay until there is abundance of pasturage. Let them have the protection of sheds and yards, and during this period fodder them night and morning before they are turned out. Strong and thrifty young cattle will find their sustenance much earlier than cows and oxen, indeed the latter should not be made to depend on grass until the spring work is terminated.

Neat cattle should always enjoy the first cropping of pasturage, and farms should be so arranged that they may have a fresh field at short intervals. It is best not to confine cattle during the night in warm and pleasant weather, but to allow them, if practicable, to lie in a convenient and secure pasture. By this practice they have the opportunity, which is very essential to their thrift, of feeding early in the morning and late in the evening. Pastures should contain an ample supply of shade trees or a wood range, and in their absence sheds should be provided for the protection of the stock. Pure running water is indispensable to Neat cattle, and they should always have access to an abundant supply of salt.

One of the most prevalent and pernicious errors in husbandry is the over-stocking of farms. It is as important and wise to adapt stock to our summer forage as to winter fodder. An excess in either case over our supply is most mistaken and improvident policy. Cows cannot be expected to yield an abundant product of milk, and young cattle will not receive their natural growth and thriftiness without they have a range of ample and nourishing pasturage. Ten cows, enjoying an abundant pasture, will prove more remunerative than twenty which are compelled to subsist on coarse and scanty herbage. When it is necessary to yard cattle during the night, they should be driven to pasture at the earliest possible hour in the morning. It is of the highest utility to pasture cows near to the milking yard.

WINTER TREATMENT.

The proper arrangement of barns and sheds for the wintering of stock has already been discussed. A plan has

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been introduced to some extent in England of covering the entire yard with a roof, This arrangement has been adopted in connection with sheep husbandry in some sections of New-England to great advantage, and I have no doubt it would be found highly useful if extended to all stock, in our colder and most tempestuous districts. Every class of stock, should be protected as much as possible from cold, wet and storms, but to none is it more indispensable than to young calves and teeming cows. Investigations in physiology prove that a large amount of food is required to maintain the animal heat, when man or brute is exposed to severe cold, and that all which nature demands for this purpose is an excess beyond that which is necessary for ordinary nourishment and support. These facts exhibit the utility of protecting stock from rigorous weather, not alone for the promotion of their comfort and health, but from the great economy it secures in the consumption of fodder.

In addition to what has previously been said in relation to stables, I may remark, that besides being warm, dry and clean, they should be sufficiently lighted and well ventilated. Sliding windows are perhaps the best arrangement to secure these objects. The comfort and security of cattle will be much promoted by the erection of stalls similar to those commonly constructed for horses. In the absence of these, a movable pole or plank should be placed between cattle. The manger should be so divided into partitions, that they can be reached alone by the animal to which each is appropriated. Stanchions which were formerly in common use to secure cattle in their stalls, were exceedingly uncomfortable and oppressive to them. Cattle may conveniently be *fastened by a rope* tied to the manger and knotted at the end, which passing round the horns should be secured by a half or slip knot. This rope should be so placed as not to expose their fore legs to the danger of being entangled in it. The patent ring and chain which has recently been introduced is however by far the most secure and reliable contrivance for this object. Cows should generally be confined to the stable, except during an hour or two each day of pleasant weather, when they may be allowed the range of the yard to drink, exercise and lick themselves and each other. The last operation, which healthy cattle always perform, is considered by most farmers to be a sufficient substitute for carding, but I think cattle confined to stables will be much benefited by being

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carded and rubbed daily. The stable should be assiduously cleaned each day and provided with fresh and dry straw as often as necessary. Cattle are rarely littered in ordinary keeping in this country, although the practice doubtless is highly conducive to their warmth and comfort, and consequently to their thrift.

In stabling, cattle should be taught to enter with regularity; the strongest being first secured; and each should have its peculiar place or stall appropriated to it, which it will soon enter of its own accord. When they are turned from the stable, one at a time should be loosened, commencing with the weakest. Water if possible should be provided in the yard for all stock, as with this arrangement they are saved from much toil and exposure to serious accidents.

It is of the highest importance in arranging cattle for the winter to place them in different inclosures, in classes according to their ages and condition. Animals will always be found in every herd, which exert a mastery over the others. The young and feeble should be protected from this tyranny, either by separation or by controling those of vicious habits. Oxen and large and powerful steers should not be allowed to run in the same enclosure with cows or young cattle. The latter will not only suffer by being driven from the choicest food by the former, but are liable also to serious and frequently fatal injuries from their attacks. The provident farmer will regularly visit his stables and yards at a late hour in the evening to assure himself of the health and safety of each animal.

Corn stalks cut before they have been affected by the frost and well cured, are probably the best fodder for milch cows. Working oxen require the most nutritious hay with some meal, proportionate to the extent of their labor; and calves require that which is fine and sweet.

When discussing the subject of stalks, I endeavored to enforce the great utility of cutting fodder, especially stalks and straw for cattle. Young cattle will flourish on coarse fodder and may be wintered chiefly on straw and inferior hay. Vegetables of every kind may advantageously be fed to stock, and these would undoubtedly be much improved in their nutritive properties by being steamed. The effect of raw potatoes

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should be watched as they sometimes create diarrhoea and a predisposition to the hoven. All vegetables should be either cooked, cut, or crushed. A spade or shovel may be used for cutting them in a box, but implements designed for this purpose, which may be found in any agricultural warehouse, are far more convenient and economical. Shorts, bran, brewer's grains, or oil cake, are each useful. When grain is fed it should uniformly be either ground or boiled. A feed of two quarts of meal daily to cattle, and especially milch cows, is of great value, in addition to the ordinary fodder.

Fattening.—An aged ox designed for fattening should be exempt from labor after the close of the spring's work, and the cow should be dried off by the first of September.

This can be effected by partially milking her at first once a day, and afterwards at intervals of two or three days, until the lacteal vessels are gradually closed and loose their capacity for secretion. Great care must be observed during this process that the udder does not cake or become inflamed Suppuration which sometimes ensues from this cause, affects the general health of the animal and is a serious obstacle to successful feeding.

Cattle turned off for fattening should have the range of the most luxuriant feed. When the grass begins to lose its vigor in autumn, pumpkins may be fed, and gradually increased in quantity. As I have before remarked, cattle should be carefully observed in reference to the diuretic effect which the seeds of the pumpkin sometimes produce. The leaves of cabbages, and of the different varieties of beets and turnips, are greedily consumed by cattle, and are useful at this stage of feeding. Potatoes, carrots, beets and rutabagas are also valuable, but the latter should be withheld at least ten days before slaughtering. As soon as feed becomes scant or innutritious in autumn fattening cattle should be confined to their yards and fed on stalks or hay in addition to roots. They require little or no water when abundantly supplied with vegetables. An animal thus treated will consume from one to three bushels of roots daily. The feed of cattle at the commencement should be moderate, and gradually increased, to avoid cloying or disturbing their fastidious appetite. By feeding them on grain for a short period before killing, the flesh is hardened, and the product of tallow much augmented.

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Butter.—The investigations of science have revealed many interesting facts in relation to the constituents of milk, and the nature of the elements it contains of butter and cheese. My space will not permit me to examine these important speculations, but the intelligent dairyman will find them worthy his investigation. The dairy-room should have a northern or eastern exposure—the first is preferable—and the room should be cool, spacious, airy and dry. The windows should be latticed.

Cleanliness is of the utmost importance. Nothing should remain in the room calculated to affect the atmosphere by the least taint or acidity, moldiness or putridity, nor should it be exposed from the exterior to any unpleasant or fœtid odors. Every impurity of this kind is readily communicated to the cream, and in consequence affects the butter. Even rancid butter, sour milk, or remnants of decaying cheese, should be excluded. Let cleanliness be practiced, even to a passion, in the dairy-room. Freeness from humidity in the air, from damp floors or moist walls, is an important feature which should be maintained. Coolness in summer, and in winter a proper temperature, above freezing, should be preserved as much as possible. A basement room, if the requisites of dryness and ventilation can be sufficiently secured, is peculiarly adapted for dairies.

Various devices have been adopted in Europe for holding milk: wooden vessels, movable and stationary, earthen, glass and zinc pans have all been used, although the last have been generally abandoned, from the danger of the milk combining with the metal in the formation of a mineral poison. I think, however, our common tin pans unite more advantages than any other vessels, from their durability, lightness, and the ease with which they are kept clean.

Every implement connected with the dairy-room, and especially the pans, should be assiduously scoured and burnished, and preserved free from every particle of acidity or moisture. It is well to expose them, after being cleansed, to the air and sun. The tin milk-pails now in use to some extent, have a very convenient arrangement, in having attached to the side a strainer and nose for emptying the milk. Bowls are also constructed with strainers, which should be made of copper, or

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better still, silver wire. The oldfashioned cloth strainer is sufficient, however, but not so convenient as these improvements.

Milk should be strained immediately after being taken from the cow, and be carried in the pail and agitated as little as possible. The depth in the pans should not be greater than two or three inches. The material from which butter is formed is contained in minute globules, which rise to the surface of the milk and constitute cream. Any great depth or thickness of milk will create an impediment to the action of this process. To facilitate it, dairy maids sometimes mingle water with the milk when it is set for cream. Cream will usually form in twenty-four to forty-eight hours, but in excessively warm weather the milk sours at a much earlier period. In winter the cream may remain until the milk becomes nearly bitter. The cream should be removed as soon as the milk begins to turn. To retard the souring, milk should be kept as cool as possible, and to effect this object pans containing milk are often imbedded in salt. After being skimmed from the milk, the cream should be placed in glazed earthen or tin vessels, which are now made for that purpose. They should be wide-mouthed, and if insects disturb the cream the mouth should be covered with coarse millinet. At every addition of cream the whole mass should be gently mixed. The cream should not be allowed to accumulate more than two or three days without churning, and in hot weather should be churned daily. Late improvements have perfected the modern churn. Without expressing a preference for any particular model, I may safely affirm, that each, constructed upon the improved plans, are infinitely superior to those formerly used.

In summer it is generally found useful to mingle ice or cold water with the cream when it is placed in the churn, and in cold weather the entire body of cream should be warmed, and brought to a uniform temperature before churning. The temperature of the cream for churning should be from fifty-five to sixty-degrees Fahrenheit. It is esteemed by many a useful practice to strain the cream through a coarse cheese cloth before churning.

The movement of the rotary churn should, especially at the beginning, be moderate, regular, and in the same direction. If churning is performed with too much rapidity the butter is apt to be soft and oily. When the butter begins to form, which

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can be determined by the increased resistance to the dasher, the churning should cease. Let the butter be immediately removed from the churn and worked over as it is termed, till all the buttermilk is pressed out. Some dairy maids wash it in cold water, while others apply no water at all.

In large dairies the operation of working butter is very laborious. A small wooden spade is the common implement used, but a machine called the butter washer has been of late favorably introduced. I formerly used in my private dairy an implement of my own construction, which I found very efficient and a great relief to hard labor. I procured a marble slab about three feet long by two wide which can always be kept cool and clean, (although a hard wood plank would be very suitable,) on the side of this, and about the center I had rivited a staple (or it may be fastened to the table,) which projected about an inch above the slab. I then prepared a lever of hard wood, about three inches square and a little longer than the width of the slab, which tapered to a handle at one end, and had a hook at the other end on one side which could be adjusted to the staple. This gave the lever a perpendicular action, while it could also be moved horizontally the whole length of the slab, and might be worked equally on the corners or the flat sides. The side of the slab next the operator should be a little elevated so that the buttermilk may be freely discharged.

The buttermilk should be completely expressed, as the smallest quantity of this substance [which embraces casein, the element of cheese], if left in the butter, will affect and render the whole mass rancid. It is the practice in some dairies to finish the operation at once, and in others to partially work over the butter and placing it then in a cool situation leave it until the next day when it is finished. Salt should be mixed during the last process of working butter. The quantity used must in a great degree be determined by taste, but as a general rule about one pound of salt to twenty of butter may be considered the proper proportion.

The quality of the salt is a consideration of the highest importance. It should not only be clean but pure from all extraneous properties. Prof. Johnston states that salt may be cleansed from these impurities by pouring about two quarts of boiling water on eight pounds of salt, stirring it occasionally for about two hours and then straining off the liquor through

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a clean cloth. The water which runs off will be saturated by the salts of lime, magnesia, &c., and the substance which remains in the cloth will be pure salt. Butter laid down for preservation or market should be packed firmly and covered on the top with a layer of salt, and a cloth soaked in brine. If a wooden vessel is used for this purpose one made of white oak should be preferred, as pine, cedar, or any other aromatic wood will communicate an unpleasant flavor to the butter. Some persons mingle with the salt used in making butter saltpeter and sugar, but without attaining I think any particular benefits.

Cheese.—In England almost every dairy district is distinguished for its peculiar mode of making cheese, but with us the general rules which prevail are very similar, although in all the details of the process scarcely two dairymen agree. I will briefly sketch, therefore, the method which, from my personal observation and experience, I prefer, without discussing the views of others. Casein, which is the ingredient that mainly composes cheese, contains about four and a half per cent of common milk. It is held in solution by the presence of an alkali. The removal of this alkali by an acid converts the casein into curd, which forms cheese.—Morton.

Various acids are used in different countries for this purpose, and in Switzerland they consider sour milk sufficient. Several kinds of juices and decoctions derived from plants, such as the thistle, crowsfoot, and flowers of the artichoke, are also used and prove adequate.

Although rennet is universally the agent applied in this country, the knowledge that other substances are appropriated to the purpose may be useful. Rennet is formed usually by the stomach of the sucking calf, although the same organ in other young animals, as the lamb, kid or pig, may be used. The stomachs of hogs killed in autumn, Stephens thinks are equal, if not superior, to those of calves for rennet. The same author advises to prepare the rennet as follows: take out the inside of the stomach, throw away the curdling, wipe the skin clean with a cloth, but do not wash it; lay it flat on a table, and rub it thoroughly on both sides with salt, and place it in a dish for four days, in which time it will have sufficiently imbibed the salt to preserve it. It is then stretched on a stick and hung near the fire to dry, and in a dried state is kept for use in the ensuing season.

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The practice of one of the most successful cheese makers I know differs somewhat from this. He washes the stomach when taken from the calf sufficiently to remove all foreign substances, such as grass or saliva, but uses the water so gently and sparingly as not to impair the texture or strength of the organ. He afterwards returns the curds, well salted, into the rennet bag, which is suspended in a dry chamber and kept for a year, and often longer, before being used, as its peculiar properties, it is supposed, improve by age. When the rennet is required for use, he puts from four to six into two gallons of water, and while the solution remains in full strength he considers two gills of it sufficient for eighty or ninety pounds of curd when pressed. In Scotland the rennet is soaked about four days in three pints of strained brine, strong enough to float an egg. A half teacup full of this liquid will coagulate milk sufficient to make a cheese of fifteen pounds weight. The rennet, after being used, may be again salted and dried, and will retain its properties.

In an ordinary dairy, two milkings are generally necessary for the making of a single cheese. Under these circumstances preserve the evening milk in tubs, which place in as cool a situation as possible in order to preserve the milk from souring. The milk of the next morning should be placed in a large tub and after the previous milking has been heated to a degree which will bring the whole mass to the temperature of blood heat pour it with the last milking. The cream from the evening milking should be taken off and may be reserved for making butter, or carefully stirred and passed through a cloth is mixed with the two messes of milk. The appropriate quantity of rennet is then mingled; it is left thirty or forty minutes when it becomes curd and is cut into slices of an inch square with a long cheese knife. It is now left to settle and separate from the whey. After this the curd is again cut, and by most operators a portion of the whey is dipped out, heated and returned to the tub. The mass should be so heated that the arm and hand can scarcely bear the temperature while the process of stirring and breaking the curd is continued by manual labor. The curd at this stage will adhere together in masses if left at rest. The curd should be worked in this manner until it is reduced to a consistence of fine particles. After the curd is rendered quite hard by scalding, the whey is drawn off by straining with the aid of a cloth and cheese basket, or by an

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implement made for the purpose, and cold water is applied to rinse off the whey and cool the curd. Salt is now mixed according to the taste of the maker. By some the curd is only partially salted and the remainder of salt required is applied by rubbing it in the cheese, while in the process of drying.

In some dairies vats are used with strainers attached, for scalding the curd and removing the whey. The cheese is then laid in the hoop and placed in the press and subjected to a sufficient pressure, the amount of which required can be easily determined and graduated by the improved presses. It is sometimes necessary to turn the cheeses while pressing in order to perfectly extract the whey, but usually it is left in the press twenty-four hours, when it is taken out and placed on a shelf in a dry chamber. It should be oiled thoroughly with lard or butter and turned daily. The turning is much facilitated, if the cheese is placed on a square form made of a wide board and a little larger than the cheese. A small quantity of annatto may be mingled with the curd to give coloring to the cheese if desired, and some otter may be combined with the oil to impart the required tint to the exterior. I have found it convenient to bind around the circumference of large cheeses a firm and stout cloth.

Cheeses formed entirely of skim milk as well as new milk are made by the same processes. When the size of the dairy will warrant it, it is advisable to make a cheese at each milking. The drying room for cheeses should be cool, free from dampness and exposure to a rough current of air. Cheeses should not only be turned daily, but all the moisture which gathers on them be carefully wiped away. The lard or butter should be applied when the surface appears dry or hard. Turning may be intermitted after the cheese begins to dry, but should not cease entirely till cool weather. Cheeses sometimes burst from the fermentation of the whey, which they have retained. This often occurs without producing a crack in the cheese, and in this event need not be regarded, but if the cheese bursts the opening should be filled with a mixture of butter, salt and pepper, to prevent injury from flies.

The following receipt is given by Mr. Fessenden to relieve cheese from skippers: "Wrap the cheese in brown paper so thin that moisture will strike through speedily, bury it in a hole about two feet in sweet earth, let it remain about thirty-six hours, when the skippers will be found gathered on the

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surface, brush them off and the cheese will be found sweet and pure."

DISEASES OF CATTLE.

A notice, even briefly, of the innumerable maladies incident to Neat cattle, would require more space than I am able to occupy, I shall therefore only refer to a few of the most common diseases and those most easily reached by ordinary remedies:

Hoof-ail.—This disease among cattle is very analogous to the rot with sheep. Its presence is indicated by a soreness and lameness in the foot; a swelling forms about the ankle, and if the disease is not promptly arrested a suppuration takes place, and frequently the hoof drops from the foot. The foot affected should first be pared down to the matter, or it may be discharged by a puncture. Wash the sore with a strong solution of blue vitriol twice a day, or corrosive sublimate may be applied, contained in an ointment made by an admixture with it of hogs-lard. The proportion of the former should be very small. A cord may be drawn with some force between the claws, and is useful in opening and cleansing the sore. The animal affected should be separated from the herd, and be confined to warm and dry stable.

Garget.—In this disease the bag becomes highly inflamed in spots, and hard bunches appear. Young cows in high flesh are the most liable to the garget. The udder becomes sore and the milk bloody. The cow should be bled, and reduced in her condition by physic and lower feed. If there is an appearance of suppuration the bag should be lanced. Youatt furnishes the following receipt for an unguent, which should be applied two or three times daily: soft soap, 1 lb.; mercurial ointment, 2 oz., and a little camphor, mixed and rubbed together in spirits of wine. The garget root, found on most farms and familiar to every farmer, grated and fed in meal, is a very common and efficient remedy. A piece about four inches long, is sufficient for a dose. Sulphur in frequent doses should also be administered.

Horn distemper.—This is one of the most fatal and insidious diseases incident to cattle. It usually affects those in a low condition, and has generally made great progress before its presence is observed. The animal exhibits evidence of the

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attack by frequently shaking the head, by a general languor and feebleness, a sunken eye and coldness of the horns. I have always noticed in cattle affected by this disease that the tuft of the tail has an unnatural twist, the extremity of the tail is hollow and soft, the skin often cleaves from the bone, and the marrow of the bone itself becomes wasted. I understand Mr. Stephens to deny that these indications are evidences of the horn-ail. Which is symptomatic of the other I cannot determine, but that a concurrence of the appearance and disease is manifested I am warranted in asserting from the observation of many years. The coincidence has not escaped the attention of most farmers. When the tail is in this condition I have always found it useful to cut off or slit it up above the affected part. When the attack is severe, or has been protracted, the lower side of the horn should be bored with a gimlet about three inches from the head, to allow the purulent matter to discharge itself; afterwards, twice daily, inject a strong solution of vinegar, pepper and salt into the orifice, which should be kept closed by a wooden plug. The pith, in severe cases, will be totally destroyed, but nature rapidly restores it if the animal survives. Spirits of turpentine should be rubbed about the roots of the horns, and be poured into the indentation between them. This application, if used in the early stages of the disease, will generally arrest it.

Milk Fever.—Cows in high flesh are generally most liable to be affected by this disease, which appears a day or two after parturition. They reject all food, manifest marked febrile symptoms; the secretion of milk nearly ceases, and they exhibit a great weakness and a paralysis of the loins. Bleeding and severe purgatives are the appropriate remedies. A writer in the Cultivator states that a combination of ether with cathartics in moderate doses will cure the severest attacks of this disease. When the bleeding is intended to be copious, the easiest and most efficient mode of performing the operation is to open with a fleam the jugular vein of Neat cattle. Local bleeding may in some cases be necessary.

Hoven is a very common and fatal disorder among cattle and is generally induced by their eating green fodder, particularly after it has been frostbitten, but it may be caused by any food which remains undigested in the stomach and ferments, or by any substance becoming fastened in the gullet. The disease is occasioned by the animal so gorging its stomach that the food

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cannot be discharged. Gas is thus engendered, which swelling the stomach excessively presses it upon the vital organs, producing suffocation and sometimes the stomach itself bursts. At the commencement of the attack, it is often relieved by driving the animal about and not allowing it to lay down. In the first stages alkalies may be given, which will neutralize the gas and allay the distention. A large tablespoonful of pearlash or soda, or a pint of lye from wood ashes of moderate strength, will generally effect a cure, when given at short intervals. Lime water is also useful. A wineglass of spirits of turpentine will in ordinary cases cause a discharge of the gas.

If none of these or similar experiments answer, it will be necessary to resort to the operation of puncturing the paunch. This can be performed with safety if proper caution is exercised. The distended paunch may readily be felt on the animal's left side about half the distance between the hip bone and the last rib. If a common penknife is thrust into the paunch, the gas will escape with great violence. There is danger however when the operation is thus performed, of the contents of the stomach and the gas itself being discharged into the cavity of the abdomen. When this occurs fatal effects generally ensue, and to guard as much as possible against it, a quill or hollow tube of elder should be inserted in the puncture the instant it is made. The trocar, a very simple instrument is used for this purpose which totally avoids the risk. Several other instruments intended for this object may be found in the agricultural warehouses. Flexible sticks, properly guarded at the end by soft leather are sometimes thrust down the throat of the animal into the stomach to open a passage for the escape of the gas. A piece of old tarred rope thoroughly bound with twine at the end, about an inch in size may be used for this purpose, and should be thrust down the gullet gently from four to five feet. When the hoven is caused by an obstruction in the throat it may ordinarily be relieved by the use of the stick or rope in the manner just described, or a dose of castor oil, warm soft soap or other oily liquid may be administered which will lubricate the substance and enable the animal to swallow it.

Choking may generally be relieved by these means, but if the obstruction is produced by any soft substance fastened in the throat, it may be crushed without injury to the animal by placing a smooth block on one side of the gullet and striking with a mallet a blow on the other.

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SWINE.

Although the wild boar is a native of almost every section of the Eastern Continent, and still occurs a denizen of some of the most extensive forests of Europe in his original condition and unsubdued ferocity, we have no evidence of his having existed in any part of America previous to the discovery by Columbus. A wild hog was found among the South Sea islands when they were discovered by Europeans. The infinite variety of the domestic hog which now exist, have all, doubtless, originated from the rough, shaggy and ferocious wild boar of the forest.

Neither New England nor New-York can successfully compete with the West in the production of pork upon an extended scale. The value of grain, and even the increased demand and price of potatoes forbid the rearing of swine, beyond the consumption of the refuse products of the farm, aided by the use of apples, pumpkins, and the coarser vegetables. An appropriate number of hogs may always be raised in connection with a dairy with propriety and advantage. When corn commands from seventy-five cents to a dollar the bushel, and other grain holds a proportionate price, it is extreme improvidence to consume these articles in the production of pork.

No animal affords greater remuneration, when suitable food is used in the rearing and fattening, than swine; none possesses so little offal, and yields so completely its entire frame for the uses and consumption of man. The swine which prevailed in New-York and New England until the early part of the present century, were as worthless in their qualities and as unprofitable as the native sheep at that period. The Woburn swine which had been sent from England at an earlier date as a tribute of respect to Washington, but not reaching their destination were otherwise diffused, had not then been introduced into these districts. The hogs which at that time prevailed were coarse, large boned, long legged, with sharp projecting jaws, flab eared, and utterly unseemly in appearance and unprofitable in all their qualities.

The first amelioration of these animals was effected, I believe, by the introduction of the Grass-fed hogs, as they were then called. These appeared soon after the importation of the Merino sheep. These swine were often called, in derision, the "Merino hog." I am not aware that this breed of swine was

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imported by Chancellor Livingston, but, like the Merino sheep, they were widely disseminated through his instrumentality, and generally in connection with his sheep. The original pair of improved hogs introduced into Berkshire county I am positive were procured from him simultaneously with the Merinos. I have a distinct recollection of the appearance of those swine; they were not large, but finely formed; the head small, the body round, well proportioned and compact, the legs were short and small-boned, the color was spotted with a dusky white upon a black ground. They were at first almost universally decried, and public sentiment was opposed to them equally with their associates, the Merinos. Their valuable qualities, however, gradually overcame these prejudices, and worked them into popular favor.

Since that period various breeds have been introduced into this country, both from Europe and Asia, some of which possess the most important and desirable properties, while others are of doubtful value. The radical division of swine is into families of the large and small varieties. Each of these are distinguished by peculiar characteristics, and these distinctive properties adapt them respectively to their appropriate uses. A brief notice of some of the most prominent of these, with their predominant habits, will aid the inexperienced breeder in selecting the kind best calculated for his wants and circumstances.

The Berkshire may be indicated as a type of the larger breeds and the most conspicuous of that class of English swine, although the Leicester, Yorkshire and some others, may be heavier, but are little known in this country. Loudon describes the original Berkshire as "in general of a tawney white or reddish color, spotted with black; large ears hanging over the eyes; thick, close, and well made in body; legs short, small in the bone, having a disposition to fatten quickly; and when well fed the flesh is fine; feeds to a great weight, and is either good for pork or bacon." Modern skill has in late years immensely improved this breed. They now not unfrequently reach a carcass of 800 lbs. weight. The pure Berkshires are usually black or white, although it is not unusual to find them darkly spotted. The sides are broad and expanded, the head of a fine proportion, the body compact and well constructed, the ears large and commonly erect, and the legs short. He has few bristles, but the hair is long and usually

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slightly curled. The flesh of the Berkshire is delicate; the pork thick and heavy. The hams and shoulders are of the choicest quality and are exempt from an undue excess of fat over the lean.

The Bedford, Grazier, and Improved grass fed, are all highly valued in different sections of the country for their great size and other peculiar and valuable properties. Many excellent and highly improved local breeds occur which have originated from crosses with the Berkshire.

The Yorkshire breed, recently imported into this country by Messrs. Hungerford & Brodie, of Jefferson county, are attracting much attention. The Yorkshire is a large white hog, which attains a very great weight, is finely formed and has very small bones for such heavy frame. He is apparently a *fine Suffolk* much enlarged. A cross upon our native breeds produces a very desirable animal. When very large weights are sought for, that is from 500 to 800 lbs., it is difficult to find a breed that will give better returns. They fatten readily, are very docile and are said to be obtaining very much favor where they have been introduced.

The "Improved Essex," which is the latest importation of swine, occupies an intermediate position in point of size, between the Berkshire and Chinese or Suffolk. They are held in the highest estimation in England, and are supposed to be a cross between the Old Essex and the Black Neapolitan. Specimens of this breed, which have been exhibited by Mr. Morris, of Westchester county, possess rare beauty. Although black they are said to be free from any discoloration of the skin, and thus escape the usual objection which attaches to black swine. Stephens, passing the highest encomiums on these hogs, speaks of them "as the breed which shows the greatest disposition to fatten, together with a due proportion of lean," and remarks also that "they are exceedingly gentle, and could attain if kept on to a great weight; and so compact in form and small of bone and offal, that they invariably yielded a greater weight of pork than was judged of before slaughtering, and more delicious hams were never cured than they afford." Morton, the editor of the Cyclopedia, states that "it is difficult to decide between this breed and the Berkshires their relative superiority." Mr. Morris attests that "the meat of the Improved Essex is of a very superior quality, the fat being firm, and the lean white, fine grained and rich flavored."

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It is affirmed that they are not subject to cutaneous affections. These representations impute to this breed most eminent qualities of excellence, and if they are sustained by the results of experience in this country, the Improved Essex will be found a great acquisition to the stock of our farms.

The "Chinese pig" was imported some years ago, but has not I think sustained its original estimation, and has been very generally superceded in its class by the Suffolk. In England, there is found numerous varieties of the Chinese breed, some of which are white and others black. The latter are the most prevalent in this country. The following are the distinctive characteristics of the breed: the skin is remarkably thin, the hair being thin and light, with scattering bristles; the legs short, with scarce an appearance of a tail, while the full and capacious belly almost trails upon the ground; the head is small and attached to the shoulders by a short and massive neck, disproportioned by its great size to the body, and when fat seems nearly to spread over and envelope the head; the ears are small and erect. The Chinese is a most voracious feeder and rapidly fattens. If allowed highly nutritious food, he becomes excessively fat, with but little lean flesh and presents, it is stated, a mass of nearly liquid, oily fat. This aptness to fatten and the deficiency of lean and muscle render the pork often coarse and unpleasant. Owing to this peculiarity the flesh of the Chinese is not well adapted for making hams or bacon. The young of this breed are tender and difficult to be reared, but they are thrifty, fatten early and rapidly with a small consumption of food. The Chinese crosses very advantageously with the common large and coarse breeds which prevail through the country, but as a distinct breed I think they cannot be commended to the ordinary farmer.

The modern Suffolk has recently attracted great, and on various accounts, very deserved attention. In England, for many purposes, it is considered almost unrivaled. It is in great request in the markets of London, and commands the highest price both from the rich quality of the flesh and the slight waste from offal. The Suffolk attains very early maturity, and the peculiar quality which marks them, and much enhances their value, is their adaptedness for slaughtering at any age. They are at all times fit for the shambles; they produce more fat pork and less lean than the improved Essex, and therefore do not afford as good hams, but are possibly more

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suitable for barreling. The Suffolks are white, with delicate thin smooth hair; the legs short, with small bones, the neck and head finely formed, the skin thin, the body round and the back broad and straight. They are singularly docile and quiet, and maintain a thriving condition when sufficiently supplied with the ordinary slops of a family. This breed is particularly valuable for a small breeder, or a family that fattens only a single pig, but they do not reach a large size, and seldom weigh 300 lbs. Their proneness to fatten, however, impairs the quality of the hams and bacon they produce. The Suffolks are admirably calculated to improve by crossing with larger and coarser breeds. Their peculiar properties, incorporated with these breeds, form a combination that constitutes an almost perfect swine. The dimensions and muscle of the one, united with the aptness to fatten and early maturity of the other, seems to unite all that is essential in the qualities of a breed of hogs. The young of the Suffolk are delicate, and I am led to conclude, from my personal observation, that the sow is not uniformly prolific, nor the boar always reliable for his procreative faculties. I have known instances where it was exceedingly difficult to excite his sexual appetite, and in others from the peculiar form and rotundity of his belly he was incapacitated from the performance of his proper functions. I once lost an entire season in the services of my breeding sows from the occurrence of this defect in a Suffolk boar I employed.

Although the meat of the Suffolk is peculiarly pleasant and delicate, they become frequently fat to such an extent as to make them illy adapted to use as fresh pork or roasters.

I fully concur in the judicious observations of Mr. Stephens, that although these different breeds may be favorably crossed to promote any specific design, it is of the highest importance to preserve each breed distinct and pure and not to pursue the cross beyond the first progeny, nor to fall into a course of indiscriminate breeding.

These views of the peculiar traits of the several breeds will convey a general idea of their respective qualities. Most of them it will be perceived possess some distinguishing properties which are desirable, and in making his selection the breeder with these facts in view must be guided by his own judgment in reference to his circumstances, location and object. Where feed is abundant, and pork is intended for market, heavy hogs will generally be found the most remunerative.

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Some general rules which will apply to all swine, should be observed in the choice of an individual. A good hog will exhibit a moderate length of body, in proportion to its size, and will possess a symmetrical form in accordance with its breed. He should be compactly formed and not have a large development of bone, the snout should be short, the cheeks full, the neck massive and finely set on the shoulders, the body round and ample and the hair thin and delicate. Aptness to take on fat is the most important and valuable quality. The chest should be deep and capacious, the shoulders widely extended, the legs comparatively short, and the thighs thick and heavy; the bones and joints should be small and the skin fine and flexible, but not hanging loosely upon the carcass. The back should be nearly straight. A black color is objectionable with many breeders, from the idea that it communicates the same tint to the skin.

The boar should be characterized by a decided conformity to these points. He should not be used for procreation until he is six months old, and that age is considered by many breeders too immature. He retains his masculine powers to a great age, but if intended for ultimate slaughtering he should not be retained for breeding after he is three years old. From that age the hog looses his aptness to fatten and does not yield the same delicate flesh.

The castration of an aged boar is a very simple process and is rarely fatal if performed when the weather is neither too hot or too cold, or in other words when he will not be exposed to the flies or heat of summer, which may induce inflammation, or to severe weather from which he may contract a cold in the wound. The testicles are extracted through slits in the back part of the scrotum, which should be carefully cleansed from blood and smeared with lard, after the extraction. It may be safe to apply a slight coating of turpentine in the vicinity of the orifices. If swelling and inflammation ensue the parts should be washed with cold water and softened by some emollient. When this does not promote a discharge of matter, the swelling should be opened by rubbing or an incision. Tar and turpentine are often beneficially applied in this stage. After castration the animal should be allowed the range of a pasture, until the danger from inflammation has passed. The tusks of an aged boar grow to a great length and protruding from the jaw become very formidable weapons. If vicious he is highly dan-

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gerous among other animals, frequently killing them by a single blow of his tusk, and unless peculiar circumstances render his preservation expedient, this fact furnishes an additional reason for his being early slaughtered. In crossing, a boar of the smaller breeds should be coupled with sows belonging to the larger breeds.

The Sow.—In addition to the qualities already described, in selecting the female it should be ascertained that she has a capacious belly, and an ample number of teats. The first trait indicates a capacity for producing a large and healthy progeny, and the latter is essential from the fact that the number of pigs farrowed often exceed the number of teats. When this occurs or the litter is too large to be prosperously nourished by the sow, the excess should be destroyed. Sows often produce eight or ten young, and not unfrequently a much greater number, but they should generally be reduced to six or eight. Old sows are better adapted for breeding than young ones and will rear a larger brood. There is also great difference in the maternal qualities of sows of the same age. One that proves not to be a good breeder, and abundant in her supply of milk, should be rejected and fattened. Some sows are constitutionally barren.

A fact peculiar to swine renders necessary the reduction of the pigs to an equality in number with the teats. Each pig at its birth selects a particular teat, and attaches itself uniformly to it, without approaching any of the others. Those which are attached to the teats nearest the fore legs are usually found to be the most thriving. The period of gestation of the sow is about sixteen weeks. She will receive the boar at a very early age, but should not be permitted to produce until she is at least ten months old. She is in heat at very short intervals, but is less inclined to receive the male when they habitually run together than if they occasionally meet. Frequently within ten days after parturition sows are again in season, and it is stated that they have been known to produce three litters in a single year. They should, however, be limited in farrowing to September, or very early in October, and to March or April. The first litter will then acquire size and strength, that enables them to endure the winter, and the spring litter, by appropriate feeding, will make excellent pork the ensuing winter, when they will be about eight months old.

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Until towards the close of gestation the sow may be allowed to run freely with the other swine, but two or three weeks before the time of pigging she should be secluded from them, and placed in a convenient and comfortable appartment. This change should not be make immediately on the eve of pigging, as the sow is a peculiarly sensitive animal, and if disturbed and agitated at that period, she is exceedingly liable to destroy her progeny. While she should be provided with a sufficient supply of light bedding, such as leaves or fine straw, great care must be observed to avoid giving her too large a quantity, as young pigs are very apt to get involved in it and suffocated, or by their crying disturb the mother, who in her anxiety often overlays and crushes them. The placenta, and any dead pigs, should be speedily removed.

The parturition of the sow is very easy, and I believe she never requires artificial aid. While farrowing she should have no interference, as any disturbance seems to arouse a propensity which sometimes appears and seems irresistable, to devour her young. When this appetite is exhibited it can usually be arrested by giving her pieces of salt pork. A pregnant sow may be fed generously, but she should not be suffered to attain a degree of fatness beyond a good condition. Fatness exceeding this is almost uniformly injurious to the offspring, and is frequently fatal to the mother. It is stated in British works of high authority, that the most nutritious food should be supplied to a farrowing sow, but this advice, I am positive, from my own experience, is erroneous. A farrowing sow has a tendency to febrile and inflammatory affections until the milk forms its regular secretions, which will be stimulated by high feeding. For a day or two after parturition the feed should be light, and if the weather is cold the swill should be given in a lukewarm state. I have known highly valuable sows destroyed by injudicious feeding at this period. The feed may be gradually increased, and in a few days she will be benefited by the most nutritious. After taking the boar a sow should be treated with great care, and if possible neither handled or agitated. If, immediately after coupling, she is tied and laid upon her side for transportation, she will almost uniformly prove unimpregnated.

Pigs.—The trough should be so arranged that young pigs may have easy access to it, in order that they may early learn

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to feed. At four weeks old they may be weaned. If the sow has a very abundant flow of milk the pigs should be removed separately and by degrees. By this course she will be gradually dried, and the inconvenience and danger of inflammatory attacks, which are often the consequence of a removal of the whole litter at one time, will be escaped. Pigs should be castrated when about two weeks old. The custom of spaying sow pigs is very prevalent in England. This process, it is believed, promotes an aptitude to fattening, and a more rapid and greater growth of the animal. The operation is not difficult, or necessarily dangerous, and I have already adverted to it in the article on Neat cattle.

Pigs after being weaned should receive nutritious and abundant food. It should be however in a form the most easy of digestion. Hence milk or a mash is more congenial to them than unbroken grain. Skimmed milk or whey is the most natural food, and if it is intended to force their growth, let shorts, grains or meal be mingled with it. Pumpkins boiled to a pulp and mixed with milk furnishes an excellent feed for pigs. They should be kept in a clean and dry, and in the proper season warm apartment. An occasional but thorough washing is very conducive to their health and thrift. By judicious management pigs littered in March may be made to weigh above 250 lbs. at eight months. Fattening pigs at this age, is far the best and most economical mode of producing light and delicate pork. The capacity of rooting in swine, is formed by the powerful muscles which run from the extremity of the snout. If this is severed when a pig, the power of indulging in this pernicious habit may be destroyed.

Pigstye.—This should be dry and spacious and capable of being made warm and secure in cold or inclement weather. When it is intended for a number of hogs, the stye should be separated into apartments in order to arrange them in classes, as the large and powerful are apt to exclude the feeble ones from the trough. If several are to be fed in the same pen, the trough should be divided into partitions, with a frame work so arranged that only one animal can approach it, in each partition. The stye should be connected with a small yard for purposes of cleanliness and for the formation of manure. A hog will never drop his excrement in his sleeping or feeding apartment if he has access to a yard. A clean and dry sleeping place, is eminently promotive of the health and comfort

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and of course thrift of a hog. This should be elevated a few inches above the other parts of the stye to protect it from the flow of water and other fluids. If this object cannot be attained by an inclination of the stye, a second floor should be constructed at the proposed height. Fresh bedding should be frequently supplied and as often as the old becomes broken up or damp. Many farmers place their hogs in cellars under their barn or stables, and this may be a judicious arrangement, if ventilation, light and dryness can be combined with warmth.

SUMMER TREATMENT.

Much difference of opinion exists among intelligent farmers on this subject. The practice pursued by each has probably some particular advantage and special circumstances may generally determine the plan to be adopted. I do not however include in this remark, the habit of many improvident breeders, who allow their swine to roam in the highway to be hunted and lacerated by dogs and to waste in roving all the flesh produced by their scanty feed. If it is deemed expedient to confine hogs in the summer in a pen, it should be sufficiently spacious to afford room for exercise, and the sleeping apartment should be large and airy.

The refuse of the dairy, is the most available food for hogs in summer, and the proceeds of the pork constitutes an important item in the profits of the dairy. When swine are fed upon milk or whey, whether they are confined in a pen, or range in a pasture, the feeding trough should be near the dairy house. The slops from the kitchen furnish a very considerable supply of hog feed when properly economized. Few families occur in the country, which cannot by this means sustain one pig during the summer, aided by the refuse of a small garden and weeds every where accessible. The fact should be earnestly impressed on the poorer classes, that one large and worthless dog will consume food sufficient to support a pig. When milk and slops are insufficient to maintain swine thus confined, in a thriving condition, they should be aided by other cheap materials. The weeds and worthless vegetables of the garden, Jerusalem artichokes, fallen fruit, are all important appliances for this purpose. Fresh cut clover, and leaves of the sugar beet, and especially mangold wurtzel, late in the season are highly valuable, but I have found no green provender equal to lucern for this use. Its growth is rapid and luxuriant, yielding a suc-

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cession of crops while it is peculiarly nutritious and is eaten by swine with avidity. A bed of lucern, forming an area of a few rods will furnish an abundance of green and succulent fodder for a single swine through a summer.

The prominent reasons assigned for the practice of confining hogs in pens, are that they thrive better when restricted in their roaming habits, and that they may be made instrumental in forming a large mass of highly valuable manure. In another place I have already fully discussed this subject, but may with propriety again remark, that the hog yard should be made the depository for every substance susceptible of being converted into manure: weeds, turf, the contents of ditches, muck, and indeed every substance which will decompose, and especially such as contain vegetable and organic matter. Swine will most industriously work over and reduce these materials, and it is almost incredible, what an amount of most valuable manure may by judicious management be thus created. This system forms a prominent feature in the scientific economy of a farm. If swine in this confinement do not receive a sufficient supply of the food mentioned above, care must be observed to furnish them with more substantial materials, that they may be always maintained in a thriving condition; but it is unsafe to press swine beyond this in hot weather.

Another method of keeping swine during the summer is to allow them the range of a small enclosure, embracing a clover ley. If the clover is abundant it will afford a large proportion of their keeping, and of coarse a greater number of swine may in this manner be carried through the season by the consumption of the ordinary food from the kitchen and dairy, with the same use of green feed already mentioned. This pasture should be as contiguous to the dwelling and dairy as possible. A shed should be erected in it for the protection of the animals from storms; it should, if practicable, also contain water, and a convenience for the hog to wallow in hot weather. Although the hog is in many respects a cleanly animal, the love of wallowing in the mud is one of his strongest passions. He delights in it, and the propensity is doubtless subservient to some economical purpose of nature, and promotive of health. The hog suffers severely from the heat, and often dies from its effects. He is peculiarly sensative to the influence of changes in the weather, and appears to presage them with unerring accuracy. Before the advent of a storm he may be observed agitated and disturbed, gathering with the greatest industry

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straw and other materials for his bed. To the farmer who is observant of his habits, he affords almost a practical barometer.

Swine, when turned into pasture, should be carefully rung and yoked. The most effectual contrivance for the first of these purposes is a common horse-shoe nail bent in the cartilage of the nose. It is tough and flexible, easily bent, and not readily broken. The most comfortable and convenient yoke is formed as follows: take two sticks of light wood, which will not readily split, bore two holes in each of them at proper distances, those in the stick intended to occupy the lowest end should be placed a little wider apart; pass through these round sticks with butts at the upper end sufficiently large to prevent their slipping through the holes. Nails passed through the round perpendicular sticks below the horizontal one at the proper distance, will keep the latter in its place. This forms an easy and effective yoke, which is less liable to fret and irritate the skin or obstruct the circulation than the ordinary triangular one in common use.

WINTER KEEPING.

A close and accurate economy must be exerted in this department, or inevitable loss will be the consequence. Under ordinary circumstances it will be advisable to winter over only breeding sows. One boar is sufficient for a neighborhood. Pigs littered in the spring, I have before stated, may be made to afford pork the ensuing winter of sufficient size, but to secure this requires the most judicious management and constant care. It is however difficult to make spring pigs attain a weight in pork that commands the highest market prices. The litters of a previous autumn, the age of which at slaughtering will exceed a year by two or three months, are probably best adapted for this object, and may be wintered at much less expense than full grown hogs or even large sized shoats. The stye for wintering should be warm and dry and as close as a proper regard to ventilation will allow.

Swine should be maintained through the winter in a thrifty and improving state, but their feed should mainly consist (to render their wintering secure from loss,) of such materials as have little value for other purposes. Apples, decaying vegetables, mangold wurtzels and the screenings of the threshing floor are appropriate for this use. Turnips and rutabaga when swine will eat them, furnish a very economical food. I have known breeding sows

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kept in thrift an entire winter exclusively upon rutabaga. Shorts, bran and brewers grains are cheap ingredients for the winter consumption of swine. In addition to sufficient food, dryness, warmth and cleanliness in the stye are essential requisites to secure the safe wintering of hogs.

Fattening.—The accomplishment of this process, with economy and at the same time efficiency, forms the great art of rendering the breeding of swine advantageous and profitable. They should not receive extraordinary feed before the first of September; although as I have remarked, hogs should be sustained in a thriving condition through the summer. No effort should be made to promote fattening, except perhaps in forcing young pigs, during that season. Hogs are extremely liable to be attacked by various inflammatory diseases in hot weather, and any unnatural degree of fatness is highly promotive of such attacks. They are frequently lost from this cause.

Confinement is very essential to successful feeding. After swine are confined for fattening, the quantity of feed should be constantly but very gradually increased until they receive all they will consume. They are prone to become satiated and cloyed if highly pampered at the commencement of feeding, refuse to feed and lose their appetite, which frequently is not again restored to a natural and healthy condition. The slops from the kitchen, milk and whey, with the auxilliary materials usually furnished by the farm and garden at that season, such as fallen apples, leaves of the different varieties of beets, weeds and lucern, will be sufficient for the early stage of feeding. Pumpkins will soon follow, which afford a most valuable ingredient at this period. They seem to produce an expansion of the frame and a muscular developement, which constitute an important foundation for subsequent and higher feeding. This fact will be corroborated by every observing farmer, although the cause may not be so satisfactorily explained. I usually commence in feeding to use pumpkins raw. The period for boiling rapidly succeeds. At the commencement, the cauldron may comprehend an indiscriminate mass of every material swine will consume. All vegetables, apples, leaves of cabbages, beets and pumpkins may all be embraced in it. Facility in boiling will be much promoted by covering the mass with the large leaves of cabbages. This prevents the escape of the steam. The cauldron however should properly have a cover fitted to it.

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Judge Buel strongly recommended the steaming of hog feed in preference to boiling. This operation can readily be performed by placing a box or barrel over the cauldron. Let the bottom of this be formed of slats, or perforated with holes, and the cauldron so arranged that the steam is directed into this vessel. Apertures should be left at the top for the escape of the steam.

Sweet apples, when fed raw, are probably more nutritious than sour, but when used in this combination I esteem the latter of nearly equal utility. They seem to impart a pleasant and relishing acid to the entire mass. After it is thoroughly cooked, the contents of the cauldron should be worked over and mixed until it is reduced to a complete mash. When three or four weeks have elapsed, meal, shorts or grain should be added, and boiled with these ingredients. The former should be gradually increased, and more nutritious vegetables be substituted for the promiscuous meterials. Potatoes and beets should now chiefly be relied on, although carrots may be profitably used, combined with the other vegetables. Small, bruised and injured potatoes should be first selected.

The closing period of feeding should be grain exclusively, with pure water for drink. This method hardens and improves the pork, and augments the formation of lard.

In New England buckwheat and Indian buckwheat, owing to the high price of other grain, are now generally used for this purpose. They are highly nutritious, but less valuable in market than other cereals, and may be cultivated at far less expense. Indian buckwheat possesses little value except for the feeding of swine. This grain should be ground or boiled until it acquires a semi-mucilageous state. Soft corn and barley may be given profitably for a few days previous to slaughtering. The American farmer, I reiterate, does not properly appreciate the importance and value of barley as a provender alike for horses, neat cattle and swine.

If sound corn is appropriated to this use, I have no hesitation in recommending that it be ground with the cob, although the opinion is often controverted. The careful and very accurate analysis of Professor Salisbury, by which he demonstrates that the cob itself contains a considerable amount of positive and active nutritive elements is apparently conclusive on the subject. In addition to this view, another striking fact may be presented: corn, whether fed in the grain or meal, is known to be a heavy, and not readily digestable substance, and very lia-

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ble to heat, ferment and sour in the stomach, and in this state expands and oppresses that organ. Now it is evident to my mind that cob meal, even if does not possess any nutritious principle, must be beneficial by its mechanical and physical effect, in rendering loose and light the mass of indigestible food which otherwise would lie heavy upon, and irritate the stomach. When opened and disseminated by the instrumentality of the cob meal, it must be made more permeable to the gastric juices, and brought more immediately within the influence of its action. The contents of the stomach, by this agency, will be more easily digested, and be more valuable and effective in imparting nutrition to the animal.

A slight degree of acidity in the food appears to be agreeable to swine, and is generally considered healthful and promotive of fattening, but care should be observed that this acidity does not extend too far, as they are apt in that condition to reject it.

Whether grain may be fed most profitably to swine entire, and whether roots and vegetables should be boiled or fed raw, are still among intelligent farmers points of controversy. I do not propose to engage in the discussion of these questions, but will only suggest a few considerations which tend, I think, to elucidate the subject. The kernels of grain, especially of corn, are exceedingly hard and difficult of mastication, and in consequence a large proportion passes into the stomach entire, and without being broken. The process of digesting substances of this kind must be extremely slow and difficult; the gastric juices cannot effectually penetrate them until they become softened and reduced by the physical action of the stomach. This action of that organ is severe, and necessarily irritates and disturbs its coats, and the grain, while it remains in that condition, swells and oppresses the membranes, and passing but partially digested into the intestines is voided while a very considerable portion remains entire. It can require no argument to prove that grain ejected in this state has passed through the system not only without imparting any nutrition to the animal, but has produced positive injury by its irritating and oppressive effects.

Very similar views in reference to the other question referred to may be presented. It is not presumed that the process of boiling yields to the vegetable any new property, or that it communicates any additional nutritive quality, but it is believed that it reduces the raw, tough and indigestible material

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into a pabulum better adapted for consumption, more easily convertible by the action of the stomach into an element of nutrition, and by being taken into the stomach in the soft and pulpy state produced by boiling, the digestive powers of the system act immediately and fully upon it, and all the nutritive principle it contains is extracted and conveyed into the system. This theory supposes that the raw vegetable passes from the stomach in a partially digested form into the elementary canal, and is ejected after imparting to the animal only a portion of the nutritive principle it contains. The expense and labor incident to the grinding and preparation of food are urged as strong objections to this practice.

Slaughtering.—The killing of swin is usually performed in a cruel and ruthless manner, that subjects the animal to much protracted and unnecessary suffering. Instead of the ordinary mode of stabbing which causes death slowly and apparently with great distress, it is far preferable, to adopt the mode which is pursued in the great slaughtering establishments, of killing instantly by a blow upon the head. A common axe will answer for this purpose, but a heavy hammer with a small spike attached, is a more effective weapon. With a smart blow the spike penetrates the brain and produces instant death. If the large vein in the throat is severed immediately the blood will flow freely. This method is not only the most merciful, but the blood is not so liable to settle about the wound and injure the appearance of the meat.

I need not particularly describe the mode of dressing hogs. The peculiar art in the successful performance of this operation is to have the water at the right degree of temperature. It should neither be too cool or so hot as to parboil the skin; but the scald should be just sufficient to start the hair. When it has reached this point, the hog should be instantly withdrawn from the scalding tub and the hair be removed with as much celerity as possible. The hair and scurf should be scraped off completely and with perfect neatness.

The following mode prevails in some districts of Europe, and quite generally among the small Canadean farmers. Immediatoly after he is killed and while still bleeding, the animal is strewn over with a thin covering of dry straw, which is fired on the side towards the wind. This rapidly singes off the hair and the hog is then thoroughly drenched with scalding water and cleansed. I think however that this method does not commend itself to our adoption.

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Cutting up and packing.—There is little necessity for any special direction on this subject. Every farmer cuts up his pork in conformity to his own plans and taste, and each housewife has her individual receipt for curing hams and bacon. I will only remark that pork should not be cut up, until it is completely cooled. The barrel before packing should be carefully cleansed and the meat laid up with an abundance of rock salt. The quality of the salt is of the utmost importance. Much of the article in market is adulterated and unfit for this use. A strong brine sufficient to cover the meat may be added. An infinite variety in the mode of curing hams exist, many of which require much labor and care. The common pickle of ordinary strength, composed of salt and saltpeter, with a slight admixture of molasses or sugar, is as effectual and safe as any for preserving them and retaining a pleasant and natural flavor. They should remain in this liquid from four to eight weeks, until they are saturated by it, but should not be salted to a degree that renders them hard and tough. They should be exposed to smoke until thoroughly penetrated by it, but not so excessively as to retain a smoky flavor. Various other methods of curing hams are practiced. Corn cobs and hard maple chips are the best adapted of any material for smoking them. In forming the hams the leg should be severed immediately below the gamble joint, and the ham while smoking should be suspended by a string secured to the upper or fleshy part. By this practice the juices of the meat which otherwise escape are retained. The skin contracting forms a contraction in the nature of a cincture about the joint. This mode I believe is generally practiced at the south, and their hams and bacon are confessedly equal to any in the world. Various expedients are adopted to protect hams from flies. Sometimes they are laid in ashes, and at others are placed in a weak brine. The most successful mode I have known is to cover them carefully with cotton cloth, which should be thoroughly smeared with common white wash.

Catching.—The hog is a very difficult animal to handle. They should be held with great care as they usually struggle violently when seized, and often burst blood vessels or cause other fatal injuries. A cord fastened by a slip knot to the upper jaw is the most effective and less hazardous way of holding them. With a little dexterity this may be secured on the animal when he is in the act of feeding.

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DISEASES OF SWINE.

Swine are subject to the attacks of numerous diseases, and are extremely unmanagable in the application of remedies. Diarrhœa is frequently very fatal with them. If the discharges are mingled with slime, a strong purgative, as salts, should be used. The dose must depend upon the size of the animal, but should be sufficient to effect a thorough operation. Follow this by the preparation which is recommended in the Cyclopedia of Agriculture, viz: Powdered opium 15 gr., prepared chalk 4 dr., powdered ginger 1 dr., peppermint water 4 oz. This is sufficient for ten doses, and should be given twice each day. When the hog feeds, this and all other medicine may be mingled with his food, but if he refuses to eat, the medicine must be administered by drenching or pouring down the throat. This however is attended with much difficulty and uncertainty. An attack of common diarrœha may usually be corrected by a change of food. Apoplexy is a very common and dangerous malady among swine. The symptoms admonitory of its approach are usually dullness and sluggishness, although the appetite is not always affected. When the disease attacks him, he staggers, falls and becomes insensible, and frequently dies in a short time. When the symptoms appear, copious cathartics should be used, and if they are not arrested by this means the physic should be followed by thorough bleeding. Although the practice is objected to by some writers, I think the most prompt and direct mode of effecting this is by slitting an ear or cutting off the tip of the tail. A more scientific mode of bleeding, is effected by opening the palate veins in the mouth. These veins lie on each side about half way between the roof of the mouth and the teeth. A large vein which appears in the fore legs above the knees may also be readily punctured. I have known the following practice very effective in severe cases of this disease: let an incision about two inches in length, be made through the skin, between or a little in front of the ears, and introduce into the wound a little fine salt.

Colic and inflammation of the intestines.—The presence of these diseases is at once indicated by the great pain and suffering exhibited by the animal. Prompt application of active and vigorous cathartics is necessary, and if the attack does not yield, copious bleeding should be immediately resorted to.

The *quinsey* or *strangles*, is a swelling of the throat attended by high inflammation. The animal affected looses the power of swal-

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lowing, the tongue protrudes, and gangrene and death by suffocation ensues unless relief is promptly afforded. The remedies to be applied are cathartics administered by drenching, bleeding, and if practicable, puncturing of the inflamed and swollen organs.

The *black tooth*, is a very formidable disease, known to farmers by this name, but is not I think referred to by any author. It is often very fatal, particularly among young shoats, and is believed to be contagious. The evidence of the malady, which seems to be of an inflammatory character is a blackness of one or more of the teeth. The attack in a few hours terminates fatally. I have seen every individual in a full stye fall victims to this distemper in a few days from its first appearance. The only effectual remedy, I believe, is the removal of the diseased teeth, either by extraction or breaking them off with a chisel.

The *mange*, is a loathsome disease, generally induced by the confinement of a hog in a filthy pen. It forms a noisome scab upon the body and arrests all thrift and progress in fattening. Let the animal be thoroughly washed in soap suds and cleansed, and then apply until a cure is effected, any ointment, similar to those used for the scab in sheep. A simple unguent formed of about equal proportions of lard and flower of sulphur, with a slight infusion of turpentine is generally sufficient.

Protrusion of the rectum, frequently occurs among swine, particularly pigs. It is generally produced by dry and hard feed, but is often the effect of violence. The animal should be kept quiet and undisturbed, and should be fed very sparingly with light food. When by this treatment the intestines are evacuated, the rectum should be carefully washed and gently replaced. Some strong thread, doubled several times, or small wire should be passed through the anus and secured. The animal should receive no solid food for several days. A hog once affected by this attack is very liable to a recurrence, and if he is in a fit condition for slaughtering, it is better to kill him at once, before his system be comes diseased by the inflammation.

Swine are liable to be attacked by numerous other diseases, but those described, embrace most of the number which may be safely treated by the common surgery of the farm.

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THE HORSE.

In my limited scope I shall not attempt to describe the various breeds of horses which are now prominent in the State, or discuss the earnestly controverted questions of their relative merits. An exposition of the rules and skill which are to be exercised in the detection of diseases and defects in this animal, would demand more space than the plan of this Treatise authorises, and indeed the subject belongs rather to the trafficker in horses than to the breeder. I propose to examine the subject of breeding and treatment of horses, in reference chiefly to its connection with husbandry.

An increased attention has been excited to the breeding of horses, and in many sections of the State it has become almost a distinct and a highly remunerative branch of stock husbandry. When wisely conducted, no occupation of the farm yields a more certain, prompt and remunerative return. A colt, from its birth to the age of three years, may be reared with scarcely greater care and expense than is required for the breeding a calf. The great disparity in their market value at that age is familiar to every stock farmer. To render the rearing of horses eminently profitable, however, animals of superior qualities should be appropriated to breeding. Whatever class of horses may be cultivated, those should be selected for breeding which possess the choicest properties of that particular breed, with their most marked characteristics. No idea of economy is more mistaken and fallacious than the plan of saving a few dollars by the use of an inferior stallion. I need hardly present the consideration that nearly the same expenditure is required for the rearing of a colt which at three years old is worth fifty dollars, as one which will command one hundred and fifty, or any higher sum. This vast difference in the ultimate remuneration may result from the primary saving of five or ten dollars in the service of a horse.

The Horses of this country, like our Neat cattle, have been derived from various countries, and combine almost every variety of the most valuable stock. The thoroughbred English horses have been widely diffused, and have imparted to our stock many most valuable properties, but I think I express the prevailing opinion of breeders when I assume that the cross of the direct Arabian blood has not resulted favorably. If this sentiment is just, it may be assumed that they are either not adapted by their habits to our climate, our treatment and forage are not congenial to them, or

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they are too light and concentrated to mingle successfully with our native breeds. I believe an infusion of Norman blood, if it is judiciously directed, and is not followed too far, communicates admirable traits to our horses; it impresses eminent hardiness and endurance with great muscular strength, and may be combined with breeds defective in these features with the most advantageous results. I may remark, I trust, without treading on delicate ground, that some of the most desirable qualities of the Black Hawk family may be traced to this influence. We undoubtedly possess among our horses individuals and tribes formed by a union of blood from these various and remote fountains, and which may now be claimed almost as indigenous to our soil, that rival in all estimable qualities the most distinguished breeds of other countries.

The art of producing fine horses is becoming more understood by our breeders and is pursued with greater energy and better judgment. In England horses are reared in reference to distinct and peculiar objects, but with us this classification prevails to only a very limited extent. They have the Racer, the Hunter, the Saddle horse, Carriage horse, Cart horse and Hackney, or as we should designate him, the horse of all works. We scarcely recognize as a distinct class the Hunter or Saddle horse. According to Youatt, in the Racer should be required length and elasticity of form, a short shoulder bone, a long arm bone, long springy pasterns and full muscular qualities. The chest should be large and capacious, to afford ample room for the action of expanded lungs and vigorous heart. The full and perfect development of these organs is the most essential feature of a Race horse. The hind legs should be set well apart. The Trotter has many affinities to the Race horse, but blood does not appear to be so necessary a prerequisite in his formation. He occurs among almost every tribe of horses. Some of our most distinguished Trotters have been found among our small Canadian horses. The prominent trait of the thoroughbreed known as "bottom," is often noticed as a deficiency in the common Trotter.

The English author, just referred to, thinks that the Hackney should not exceed fifteen and a half hands, and rather prefers to have him below that standard. In the Hackney, the bones below the knees should be deep and flat, the pasterns short and oblique, but less so than is required in the racer; the feet should conform to the size of the animal, neither too hollow or flat, but should be round and stand even on the ground. The fore leg should be

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straight, the chest full, the barrel round and the back straight and short. The hind quarters should be rounded and not dropping down, the tail well set on, and the hind legs sinewy and deep. The Carriage horse is in much demand and at high prices. He should be larger and of heavier proportions than the horse of all works; he should have a stately action, a fine arching neck, firm feet and fashionable color, but great swiftness or endurance, particularly the first is not so essential. The Cart horse is another valuable class for raising, and should be still larger than the Carriage horse, heavy and massive in his structure, possessing a momentum in weight that will aid in his peculiar occupation the strength of muscle. His neck should be large and muscular. Color in some of these classes is an important consideration. The different varieties of bays, especially those with black manes, tails and legs, are at present most esteemed in market. Creams have been highly fashionable, but are generally regarded by breeders as deficient in muscle and constitution. Black predominates among the ordinary English breeds, but is said to be almost unknown in that country among the pure thoroughbreeds. With us the color is conspicuous in one of our most esteemed families. Great size, except for the particular services I have already indicated, I do not esteem a quality of the first importance. A horse of medium size, finely and compactly formed, possessing the same points, is usually, I think, more active and enduring than those of larger dimensions. As Roadsters they are generally superior, and so I also regard them for the ordinary labor of the farm. For heavy team work, which is laborious and slow, a large horse is the most useful and efficient. A medium horse should weigh about 1,200 lbs.

The signs of a good horse are a high arching neck neatly attached to the body, but at the junction full and muscular; a full chest, a small and fine head, ears rather long but delicate and flexible, a short and straight back, wide spread nostrils, with a red tinge inside; the eyes sprightly, full and resolute; the shoulders elevated and extending backward, the fore legs spread and straight; the hips should be large and long, the loin broad, straight and with a strong developement of muscle, the tail straight, the thighs should be largely developed showing the presence of powerful muscles, the hock should be large, the space between the knee and pastern should be short in proportion to the length of the leg, and flat and broad, the hoof should be hard and of a good size, but not white, as this color is supposed to indicate

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tenderness; the ribs should be full and rounded and reach near to the hips. A Roman nose is commonly disliked. No appearance more impairs the beauty of a horse or affords stronger evidences of a want of strength and capacity for endurance than a thin and contracted body placed upon long, light and slender legs. Strong proof of the correct figure and exact proportions of a horse is furnished by the fact that measurement proves him to be larger than he is judged to be by the eye. A horse may be best estimated and more correctly appreciated in the morning, as any latent defect can at that time be most readily detected and he will then most clearly exhibit his natural qualities.

Breeding.—The breeder should act in selecting the tribe of horses he proposes to rear, in reference to the distinctive qualities of the different classes. The use for which they are intended, the demand and value of each, should be taken into consideration. The rearing of the blood Racer, and measurably of the Trotter, is best adapted perhaps to the exclusive horse breeder, but I perceive no sufficient reason why the occupation should not be embraced in ordinary stock husbandry. The price of these horses is so exorbitant that the business, when successfully followed, is eminently profitable. Much depends upon the qualities of the mare in perfecting these animals. If not thoroughbred they should be fast, and be characterized by an ample development of the organs of respiration and their accessories, which promises endurance and bottom. A fast native mare, coupled with a blood stallion of speed, is calculated to produce a valuable race horse or trotter.

The cultivation of breeds on a farm which it may be estimated will yield at three years old from one hundred to two hundred dollars, should ordinarily satisfy the ambition of the farmer. The Morgan and Black Hawks may be referred to as types of such breeds, although it is not unusual for individuals of these tribes to command, with no extraordinary treatment, from one thousand to fifteen hundred dollars. The traits already described, should be possessed by the stallion of each variety of breed in a prominent degree, and in addition to these, he should be conspicuous for evidences of great masculine vigor and energy, combined with activity and sprightliness. He should never be used when he exhibits a sluggishness of his sexual powers, or when his appetites cannot easily be excited. The mare should also be distinguished by the decided possession of those traits which should mark her breed. Her belly should be full and capacious, but not protu-

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berant, the udder well developed. Both the horse and mare mare should be free from all disease or taints, and emphatically of such as are hereditary, or which may become such. Docility and kindliness, and a freedom from all vicious habits or propensities, should be required. Animals of near blood should not be crossed.

In the breeding of no stock is it more essential to seek a combination of good qualities in crossing, and to avoid an augmentation of defects. Thus a mare may possess in great excellence many superior properties, and yet be defective in some particular points. In this case let a horse, if possible, be selected that is characterised by the possession of these points, the absence of which constitutes the defects of the mare. The perpetuation of any decided quality will be secured with more probability by propagating from a family which for a long period has been conspicuous for them, than by using an individual which possesses them only by accident. Temper and docility may be as easily promoted in breeding as form or action, and they are of equal importance.

Farmers are apt to put their mares to breeding at too early an age. The interested owner or leader of a stallion is very prone to cherish this practice by assurances that young mares are improved by early breeding and produce the choicest colts. Common sense as well as experience will readily detect the fallacy of this reasoning. No animal in a domesticated state should be allowed to breed until it has attained the maturity of its physical powers and the complete development of its form. A young mare appropriated prematurely to breeding is generally deteriorated in these respects herself, and is illy qualified for the growth and production of the fœtus or the subsequent nourishment of the foal. Under ordinary circumstances breeding may be judiciously delayed until the mare is six years old. The stallion may be used with a limited number of mares at four years of age, but it is as a general rule safer to reserve him until he is five. Sometimes at three years he is allowed to leap a very few mares and msy do so without injury, but this course should never be pursued as a system. Stallions retain their procreative powers to a great age. Mares differ in the term of their breeding, some ceasing at a comparatively early period, while others continue to produce colts to an advanced age. I have been informed of a remarkable mare, which after having produced a colt annually for twenty consecutive years, died in foaling at the age of twenty-six. The impression prevails that the foals of old

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mares are deficient in vigor and constitution, but I have never witnessed any marked verification of the idea.

The mare should be relatively larger than the horse. The general treatment and feeding of the stallion, is a subject that appropriately belongs to another occupation rather than husbandry. The habits and management of the mare, however, deserve some notice. She should never be subjected to the embrace of the horse except when in season. The expedients sometimes resorted to of hampering and otherwise confining her, are as inexpedient as they are cruel and revolting, for she cannot be impregnated under such circumstance. The mare manifests her repugnance by kicking and voiding water, and these signs are conclusive, except, which is sometimes the case, her opposition is subdued by the teasing of the horse. When in heat she returns his caresses, the vulva opens and she emits. If she is in season the only precaution necessary is to place her on smooth and level ground and to hold her head steadily until the horse leaves her. Some horse leaders recommend to throw a bucket of cold water upon the mare immediately after coupling to secure impregnation; others advise her being moved rapidly about, and others resort to a slight bleeding at the moment. If the semen is freely ejected soon after the act it is quite certain that she is not impregnated. An experienced breeder informed me that he had found no difficulty in his mares catching after he adopted the following method of treatment, when they are in full heat. After a leap he separates the mare and horse for an hour or two and then repeats the leap. It is said that the mare and horse each drawing a deep sigh immediately in coupling affords a certain evidence of impregnation. If the leap has not been successful the mare is generally in heat at intervals of about nine days, and it occurs usually about four weeks after foaling. The fact of pregnancy may be determined after about the fourth month, by placing the hand upon the belly of the mare just in front of the bag immediately after she has drank cold water. If she is pregnant the motion of the foal will be easily detected.

Mares go with foal about eleven months, and with horse colts somewhat longer. Their parturition is rarely attended with any difficulty. In the event of an unnatural presentation occurring, the management should be the same as has been described with cows. Some careful breeders are in the habit of removing the shoes from the fore feet of the mare previous

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to her foaling, to prevent injury to the foal in her attempt by pawing to aid its efforts to extricate itself from the membrane in which it is enveloped. The signs of the approach of parturition are, the relaxing of the muscles on each side of the root of the tail and the exuding of a waxy substance from the teats. The mare will continue to feed until in the very act of foaling. She should not be confined to a stable when the period approaches, but let her have the range of a secure enclosure, or of a dry and warm yard. The colt will immediately get upon his legs, but often requires assistance in his first attempts to suck. The placenta will speedily be discharged and should be at once removed.

Mares when pregnant are the most impressible of all animals to the influence of the senses of seeing and smelling. If this sensitiveness is disturbed they are peculiarly liable to slink their foals. They never should be exposed to seeing or smelling fresh meat or blood. I knew a highly valuable mare which lost her foal from smelling the blood of a freshly killed chicken. A quart or two of wheat given twice a week after about the sixth month I have found to be a uniform preventative of these accidents. Blows and severe labor often cause abortions. Mares with foal require generous and nutritious feed, but grain given in any considerable quantity is injurious. It is neither safe for the dam nor advantageous to the foal to attain a high condition in flesh. Working mares may be employed during gestration in the ordinary labor of the farm with little interruption, although it is advisable to suspend their labor for a short time before and after foaling.

When a mare is devoted to breeding exclusively, the best course is to give her through the winter, the free range of a protected yard, with access to a warm stable. Provide her an abundant supply of clean and fresh hay with occasionally vegetables and pure water; keep her well shod and subject her to no restraint or compression by a halter or strapping a blanket upon her. In this treatment she is less exposed to accident and the natural growth and development of the fœtus will not be impeded.

Mares are sometimes affected by a swelling of the lacteal glands, which frequently lead to severe inflammation. It generally occurs three or four days after foaling, and is often so painful that the colt is not allowed to suck. Apply to the bag emollients, wash it in warm water, and discharge the milk if possible. Bleed the

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mare copiously, and administer laxative medicines. If the udder becomes swollen before parturition, bleed the mare and reduce her diet. In bleeding, the common method of opening a vein in the neck is the safest, and equally efficient. The hemorrhage can easily be controlled by the simple process known to all farmers, but it is often difficult to arrest it when the horse is bled in the mouth.

Colts.—It is advisable to have mares foal in May, although some of the finest horses I have ever seen were fall colts. The mare, while suckling, should have the range of a most abundant pasturage. If she is worked or driven to heat her, the foal should not be permitted to suck until the milk in the bag has become cool. The most serious disasters to the colt frequently result from inattention in this respect. He may be weaned at three or four months old, but I have found it convenient usually to allow him to run with the dam until both are taken up for winter. They can be separated then with less risk and trouble than at any other time. After the separation the bag of the mare should be carefully watched, and be milked occasionally if it appears swollen or enlarged. The secretion of milk by a mare is very great, and if it remain in the udder is very liable to inflame and permanently injure the lacteal veins. Foals dropped in autumn should of coarse continue with the dam until spring, or late in the winter, when they may be weaned on hay, if sufficient grass has not appeared. A colt may be speedily taught if necessary, to drink, and may be raised on the milk of a cow.

Colts, during the first winter, should have a warm and dry stable or shed, but I think it expedient for them to stand on the earth if it is free from dampness and smooth, as they are very liable to be affected in their feet and legs by contracting ringbones and other diseases if allowed to stand on a plank floor. Their feed should consist mainly of the sweetest and finest hay, well cured and free from must and dust. Much difference of opinion exists on the subject of feeding colts with grain; I think, however, it is well established that grain should not be given to them in large quantities, or in a too concentrated form. One or two pints of oats, mingled with bran, is useful. Two or three quarts daily of fine feed, or good bran, is a provender which many breeders prefer. The bran has a tendency to keep the body open and healthy. Carrots are a safe and nutritious aliment. A young colt should never be stinted in his provender, and always be maintained in a thrifty and vigorous condition. They are very apt to be infested by lice, which will materially impair their thriftiness and growth under any treat-

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ment. They should be frequently and thoroughly examined to detect the presence of these vermin, and if they occur, the same management should be efficiently pursued as has been recommended with calves.

Young colts should be habitually fondled and fed from the hand. They will soon delight in this usage, and will approach the keeper for his caresses. This practice should be persisted in after they are turned out to pasture, and always maintained, even after they become horses. Habits of docility and kindness will be thus formed which will render them under all circumstances gentle and manageable, and enable them to be approached with ease, and avoid the inconvenience and vexation of having a horse difficult to be caught.

It is peculiarly desirable to provide water in their yard for all young horses, in order not to expose them to injury from slipping on the ice, or struggling in deep snows and mud. It is highly advantageous to them, and indeed to all animals, to derive in winter their water from warm streams or springs, for they are chilled, and often become seriously diseased, by drinking cold, icy water. Colts, after the first season, do not require that close attention necessary at an earlier age; they will bear greater exposure, and should not be highly pampered.

One of the most sagacious breeders with whom I am acquainted is in the habit, in autumn, of turning his young horses of two or three years old upon a meadow or pasture range on which the after feed has not been closely fed off, and leave them there without foddering, but with access to sheds, long after the snow has covered the earth. They paw away the snow, and thus reach the ground. His theory is, that there is not only economy in the practice, but that it imparts vigor and hardiness to the horse. Without assuming to entirely endorse this management, I am able to assert, that his rearing of horses is attended by eminent success, and that he breeds some of the choicest animals I have ever seen.

If a colt exhibits propensities to be unruly he should be taught restraint at an early age, by the polk, or if necessary by severer measures, such as the fetter. The habits of colts will much depend in this respect upon those of old horses with which they run. If the latter are controled the former will seldom be unruly. Bad fences will always excite and promote vicious habits.

Breaking colts.—This is a critical and troublesome process, if they are allowed to acquire notions of independence by roam-

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ing in unrestricted freedom and wildness until they have reached the period for breaking. The education of a horse should commence while he is yet a sucking colt, and it may be progressive, advancing from stage to stage, until he finds himself subjected to the bit and harness without having a suspicion of any harsh or severe change. The horse is a very intelligent and sagacious animal, fully appreciating kind and gentle treatment, and should never be revolted or alarmed by blows and severity in manner or language. If he is uniformly treated with kindness and gentleness he will return the usage by docility and affection. When he is a foal of two or three days old he should be gently handled and caressed and thus accustomed to an intercourse with man. A colt is sometimes hitched to the wagon or bit of the dam when she is driven on the road. Many object to this practice as calculated to detract from his native spirit, but I cannot perceive the force of this objection, neither have I seen this effect in colts subjected to the treatment. It is certain that they will thus be made familiar with the objects on the road and the clanking of the vehicle and harness. In any event he should be broken to the halter and accustomed to be led immediately after being weaned, and it is not amiss to also bridle him the first winter. During the second winter he should be bridled, but not rode except occasionally by a light boy. At three years of age he should be broken but not required to perform any except light work and that not habitually. He should at first be accustomed to the harness by having it placed upon him gently and after a short period without driving him let it be removed. When he has become familiar with the harness drive him with a well broken and steady horse without any load. Let him be gradually and carefully accustomed to draw, increasing the burthen until he is made to understand his own powers. Nothing is more injudicious or mistaken than to leave a colt untutored until he is three or four years old, and then to seize him by physical force, imposing a harsh halter, tieing him to a post and leaving him for hours to struggle and strain himself with often fatal results. Patience and gentleness are the most important instrumentalities to be used in subduing him. All evidences of obstinacy and ferocity of temper should be counteracted by patient and unyielding perseverance, while his natural timidity and apprehension should be overcome by kindness and caressing. The generous nature of the horse will almost uniformly yield to this management. A colt should not be put to severe labor until

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he is four years old and then be used with great care and discretion.

Castration.—Early in autumn, or late in the spring, when the weather is mild, is the most suitable season to perform this operation. The colt should be in a healthy condition, but neither too low nor too high in flesh. If the first circumstance exists, he may not be in a condition to endure the operation, and under the latter he will be liable to the occurrence of inflammatory attacks. When his habit is remarkably full, bleeding is prescribed, in order to avert the tendency to inflammation. Castration may be performed at any time after the testicles have fallen down, but I believe it is now generally esteemed the safest practice to delay the operation until the colt is about two years old. It is thought that this course induces to a more full physical development, and especially to an expansion of the muscles of the neck, loin and hind quarters. The operation is simple, and generally safe, but it is best to entrust it to one who is professionally experienced and familiar with the process. Such persons are usually provided with the necessary apparatus for castrating the animal, and in this situation the work may be executed with much greater ease and safety. The testicles are removed by cutting a slit in each side of the scrotum. Some prefer to merely scrape off the cord, while others accomplish the purpose by torsion.

The application of a little lard or oil to the wound, and, if the season requires it, smearing the contiguous parts with tar or spirits of turpentine, is the only subsequent treatment required in ordinary cases. If inflammation and swelling ensues, the practice as commended with swine in similar circumstances may be pursued. After castration the colt should be kept in a dry pasture, and have the protection of a shed or thick grove. If the weather is cold or damp it is advisable to stable him for a few nights. Aged horses are frequently castrated, but the operation is attended with more risk than when it is performed on colts. Mares, and particularly young ones, should not be allowed to run in pasture with perfect horse colts.

Nicking and Docking.—These are cruel and seldom necessary operations. The tail of the horse is supplied by nature equally for use and ornament to the animal, and to me it seems an evidence of bad taste to meddle with it. Sometimes the switch is so long as to be an incumbrance in deep snows and mud,

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and in that case may properly be shortened. Nicking, under every circumstance, is a barbarous practice, which I perceive with great gratification is falling into general disuse.

WINTER MANAGEMENT.

Although I have largely discussed the subject of barns and stables, a few additional considerations, applicable particularly to horse stables, may be appropriate. To have a horse stable warm and dry is of the utmost importance, but with these essentials it is equally necessary to combine a sufficient degree of light, and an ample ventilation. This last requisite is not generally appreciated, and is too often entirely disregarded. The confinement of one or more horses in a close stable, from which there is no escape for their breath, the steam from their heated bodies, or the exhalations of gasses evolved from their excrement, deprives them of comfort and rest, and must exert a most unfavorable influence upon their health. If evidence is required on the subject, enter early in the morning a pent up stable of this kind, and for a moment breathe the fœted and polluted atmosphere in which the horse for many hours has been confined. Numerous fatal distempers are engendered by this treatment. In attaining, however, the great object of thorough ventilation, the horse should not be exposed to a current of cold air, flowing directly upon him from an open door or window. The stable should be spacious and high, to allow the exhalations to escape, and be aired by slide windows properly situated. When it is low, or under a loft, funnels should be constructed from the stable through the roof. If it is intended to occupy this loft by hay or other fodder, the top of the stable should be closely ceiled or plastered, as the exhalations from the stable, if this precaution is not taken, impregnates and essentially injures the fodder.

Stalls should be about six feet wide, eighteen deep and eight high. These dimensions afford the horse space to raise his head, to reach with his mouth all parts of his body and to lie down without being confined. Let the partitions between the stalls be constructed firmly and sufficiently deep and high to prevent the horses kicking or biting each other; and it is also advisable to separate the racks and manger in order that each animal may be limited to his own apartment. If a rack is used it should be low, that the horse may not be compelled in eating to uncomfortably stretch his neck. Large mangers for feeding hay with a box at-

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tached for grain, are obtaining extensive use and are generally preferred. The rounds of a rack should be so near together as to prevent the introduction of the head. Great care must be observed in tieing a horse in the stall. The halter should not be so short as to interfere with his comfort, nor so arranged as to expose him to get entangled in it. Let the head stall fit closely to the head. I am induced to express this caution from having recently lost a fine young horse, which resulted from inadvertence in this respect. While scratching his ear, as we conjectured, his hind foot was caught in a headstall which set loosely on him, and in struggling to extricate himself he perforated by a sharp cork of his shoe the jugular vein, and thus bled to death.

The harness of each horse should be neatly and securely arranged near his stall, and kept properly oiled and cleaned. Every farmer who kills his own beef may provide himself the best material for this purpose, by boiling the Neats-feet in a caldron of water and skimming off the oil that rises to the surface. Horses should be carefully groomed once certainly each day, and twice is better. The stable should have an abundant supply of litter for the night. It should be removed in the morning, shaken up and dried. The portion which becomes incorporated with the manure and is thrown out, is not lost, for if you choose to give your cattle access to the dung heap, they will eat the litter with great relish, or if it remains it constitutes a valuable element of manure. The stable should be cleaned twice each day.

Horse hay must be fine, sweet and well cured. Clover is not congenial to them and is decidedly injurious when it is affected by mold or smut. In this condition it has a tendency to produce the heaves. Horses, least of any animals, should be fed on musty hay. The proper quantity of hay as well as grain may be determined by experience and observation. Different animals require different quantities for their support, and the supply also depends on the labor they perform and the temperature of the weather. They should receive no more than a sufficient amount. When unrestricted in their consumption of hay they frequently gorge themselves, and thus are incapacitated at the time for efficient labor; the food passes through them without digestion and consequently without affording nourishment; gases are formed in the stomach by the fermentation of the undigested mass, which cause colic and other attacks, and often the vigor and constitution is permanently impaired. The habit is formed in the horse by excessive feeding, of picking out the choicest part of the fodder

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and trampling under foot the remainder. Cutting hay or straw is an economical and judicious practice, which should be more generally adopted. Hay prepared in this method is believed to be more nutritious owing to its being better adapted for digestion and a less quantity is necessarily required for the proper sustenance of the animal. I have not space to explain the physiological causes which produce this result, although they are very obvious to my mind, but I have the assurance of various practical men who estimate from their personal experience, that cutting fodder effects a saving of nearly one half in the amount consumed, while the teams are maintained in a more reliable and vigorous condition. Mr. French, in a highly interesting article in the Country Gentleman, presents facts which show that cut fodder given wet to horses mitigates if it does not suppress the heaves. I can corroborate his views of the utility of this practice from my own observation. I have been accustomed to give rye straw cut fine and mingled with meal to horses affected by the heaves, and have found that it not only assuages but apparently cures them. I had however been inclined to impute the effect to some property contained in the straw. When cut, every kind of straw is a profitable fodder for horses. All who have fed rye straw to them are aware that it imparts to their hair a peculiar and brilliant glossiness.

Experiments have been made in the French service, and conducted with great detail and science, to determine the comparative value of various articles for horse feeding. The trial embraced every combination and form of provender, and resulted in the conclusion that cut straw mixed with meal was the cheapest and most effective food. Oats is the only grain which can judiciously be given to horses in its natural state, and even that may be cooked or crushed with advantage. The horse swallows his food without thorough mastication; his stomach is small in proportion to his size; he is not ruminant like the ox, and his food is retained in the stomach but a short time. From these facts it is evident that hard grain will not continue long enough in his stomach to become softened and digested, but passes in a large proportion into the intestines, without assimilation to chyme, and is ejected in an undecomposed condition. When corn or other hard grain has been fed in its original state to horses, a very considerable part will be found in the dung, without presenting any appearance of having been subjected to the process of digestion. It can require no argument to prove that this grain has been injurious rather

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than beneficial to the animal. Grain may be prepared for feeding by either being boiled or crushed.

In most Oriental countries, and in some parts of Europe, horses are habitually fed with baked bread and cakes. Barley, next to oats, is the most natural grain for horses. Corn may be objected to, as too heating and inflammatory; wheat as too concentrated, and buckwheat as possessing a slightly narcotic property. Rye is growing in favor as a hearty and nutritious aliment. Many who have used it prefer to boil rather than crush rye, under the idea that boiling frees it from a noxious principle which is retained by crushing. I have elsewhere given my reasons for preferring to have corn ground in the cob. Any other grain may be usefully combined with the corn in grinding.

No fixed rule can be prescribed in reference to the suitable quantity of grain to be fed to horses, but it must be governed by the circumstances and judgment of the keeper. Stephens gives the following formula: 10 lbs. of oats, 22 lbs. of hay. He contrasts this with another formula of cut straw and prepared food, and pronounces the latter the best and cheapest.

Hay should always be combined with grain or roots; it fills up the animal, and prevents the injury which would result from the feed being too stimulating and concentrated when it consists exclusively of grain. If a single handful of wood ashes is incorporated once or twice a week with the grain of horses, it will be found almost uniformly a preservative from attacks of the botts. Horses eat vegetables with great avidity, particularly Swedes turnips, potatoes and carrots. Carrots, of all vegetables, are decidedly best adapted for them. Potatoes are too watery and laxative for permanent feed, but may be given with benefit occasionally, or in connection with dry fodder.

The nutritive qualities of vegetables, and their useful effects generally upon the health of a horse, I have no doubt are much augmented by their being cooked before feeding. It is desirable, however, that they should be fed in as dry a condition as practicable. Vegetables cooked require little mastication, are easily digested, and impart all their nutritious elements to the horse, but the practice is attended with much trouble and labor, and has not been, I believe, extensively adopted in this country. If horses cannot have access to water at pleasure, which is desirable, they should be supplied at least twice a day. The re-

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mark already made in reference to cold, icy water given to colts, applies to all classes of horses.

SUMMER TREATMENT.

Young horses, and indeed every kind except those employed in work, may be turned off to pasture at an early day in spring. As soon as the new grass has freely started they will obtain a support, although it may be expedient to give a light foddering at evening and morning until the pasturage becomes sufficiently abundant. I may here repeat with propriety what I elsewhere have stated, that horses should be restrained efficiently when they are first turned out in the spring by thorough fences, and, if necessary, by polks and fetters. Habits thus formed will continue. If they are permitted at this season to roam over the farm at liberty, they will be controlled with great difficulty when the meadows and grain crops present so many allurements to excite their unruly propensities.

When the nights are cold and damp, either in the spring or autumn, horses should be protected by stables or sheds. A dry and sweet pasture is the most congenial to horses. They should be constantly supplied with salt and have access to pure running water. A shed should be erected to which they may resort, if their pasture does not afford ample protection by groves or a wood from the sun and storms. It is very important for a pasture to contain shade trees in open positions. To such places horses love to resort, as they find there at the same time protection from the heat and from the flies and insects which excessively torment them at this season. The latter are swept away by the winds and breezes of summer. Horses bite very closely, and in this habit very much assimilate to sheep. These animals should not be depastured together in the same range. Horses may be soiled with great economy and advantage if time and the circumstances of a farm render the practice convenient.

Working horses.—The treatment of teams when engaged in the work of a farm does not receive sufficiently the care and consideration of every farmer. A good horse employed in the moderate labor of a farm should attain an old age. The essential requisites of a working horse are good size, strength, quickness and docility. A high spirited animal, or one of great value is not appropriate in this place. One of the first qualities of a farm horse is that he be a rapid walker, and much of his efficiency and usefulness depends upon his possession of it.

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This faculty is quite as much the result of education as of natural qualities.

Under ordinary circumstances it is judicious to use mares for working teams upon a farm. Except during a short period immediately before and after parturition, they are equally serviceable with geldings. They also possess the manifest additional advantage of annually affording colts, and in the event of being incapacitated by accident for labor they are still valuable as breeders. Horses devoted to farm work ought not to be highly pampered, but should be kept generously so as to be sustained in a vigorous and sprightly condition. A team ill fed and consequently in low flesh and feeble, will not accomplish one half the labor as one in appropriate keeping.

The harness and particularly the collar should be accurately adjusted to the horse. If the latter is either too tight or too loose it galls him and seriously affects his respiration. Let a team employed in work be fed early in the morning and abundantly. The comfort and rest of the team will be vastly promoted if the harness is entirely removed while they are feeding at noon. Let them be carefully rubbed down, cleansed from dust and sweat, be well fed and allowed a sufficient time for partial digestion before the afternoon labor is commenced. Horses should not be put to severe work immediately after eating and upon a full stomach. If they are permitted to enjoy the rest and relaxation of two hours at noon they will perform more work with less wear to themselves than if they are deprived of this repose. At evening let them be thoroughly groomed and their feet, legs and bellies studiously relieved from all mud and filth which may have collected about them. I think it best to allow the long hair which grows around the fetterlock to remain upon working horses. It seems to be a provision of nature to shield the pasterns. The practice with many teamsters of driving horses at the close of work into a cold stream and there washing the legs and feet is pernicious. It creates a sudden and severe chill which may cause serious diseases and also induces a dangerous determination of the fluids to these members. A team hot and reeking with sweat from severe work should not be placed at once in the stable or permitted to stand still, exposed to the cold or a current of air. Let them be moved about gently until the heat and pulsation are abated. After this is effected they should be well groomed and perfectly dried off. When they have been exposed to rain,

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horses should not be left to become dry by the evaporation of the dampness from their bodies, for chills, colds and inflammations are often induced by this treatment, but let the wet be carefully removed, first by the comb and afterwards by the vigorous application of the brush and wisps of straw. A horse should never be placed in a stable or turned into pasture at night when the weather is cold or damp with his hair and skin in a moist condition either from sweat or rain.

When a team is warm from work in the winter, they should be carefully stabled at noon, and protected by blankets. It is wise to go some distance to secure these protections rather than to subject them to be chilled while feeding and to contract colds by exposure to harsh and piercing winds without a covering.

DISEASES OF THE HORSE.

Horses are liable to a multiplicity of diseases, and of so complicated a nature that the explanation of them would require the scope of an entire treatise. I propose to notice a few of the most common and to suggest some simple and home-spun management of them which is within the means of every farmer. Excessive doctoring, which is the peculiar vice in our treatment of horses should be avoided. More destruction annually occurs to the life and health of these noble animals from harsh dosing and ignorant quackery than from all the consequences of disease.

Botts.—The first symptoms of their assault is exhibited by the pimples on the under side of the upper lip becoming large and swollen. The horse manifests much suffering, bites his sides and throws his head against his breast and sides. I have already referred to an effectual preventive.

When the attack appears let the horse be briskly exercised until his blood is warmed, then bleed him copiously on the third wrinkle of the mouth and compel him to swallow the blood. The botts are attracted by the blood and relinquish their hold upon the viscera. Give a thorough dose [about a pint] of castor oil immediately, and in an hour repeat it. This will eject the botts and effect a cure.

Heaves.—When first attacked by this disease, the breath is longer than is natural, but no gasping appear as occurs in the later stages. The disease is produced by over driving after feeding and drinking, or by the use of musty hay or grain. I have noticed in another place the utility of cut straw or hay moist-

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ened in this malady, and will merely add that a little salaratus water two or three times a week will mitigate it, but a more successful remedy, is to feed a teaspoonful of sunflower or flax seed twice daily with his grain. If this practice is followed with perseverance it will suppress if it does not cure the heaves.

Spavin.—A wrenching of the leg or joint produces the bone spavin; a strain of the blood vessels, which forms a gathering at a particular point creates the blood spavin; a wind spavin is also caused by a strain. A perfect cure of a spavin is rarely if ever accomplished, but the soreness may be temporarily relieved by bathing it with a preparation made of equal parts of oil of spike and oil of beganum, and heating it in with a hot iron.

Cholic is produced by drinking cold water, eating green food and various other familiar causes. Some horses are subject to it at regular intervals. Gin and black pepper mingled and moderate exercise with slight bleeding will usually effect a cure. Many instances of inflammation of the lungs or stomach are caused by violent running or harsh treatment to which horses are often subjected, while they are suffering from attacks of the cholic, which is always accompanied by a certain degree of distention and irritation of the viscera.

Founder.—Grain sometims occasions founder, but it is more frequently produced by drinking when warm. One of the most effectual remedies is to bleed thoroughly, administer copious doses of salts and bathe the hoof affected carefully with spirits of turpentine.

Swelled leg.—Many causes produce this affection. The legs of horses and especially colts, often swell by standing on the plank floor of a stable. It is sometimes occasioned by a strain, a wound, or taking cold. Let the animal be physiced thoroughly with salts, feed for the time no grain, exercise gently, keep the leg wet with beefs brine, and rub it vigorously at least every hour.

Stifle.—Is usually produce by injury to the horse while getting up or stepping on a rolling stone. The cords being strained are extended, and thus the stifle bone slips from its socket. A stifle is easily cured if attended to in season. Nothing further is required except to bathe the cords with some stringent substance, which tends to contract the muscles and restore the stifle to its proper position. A strong decoction of white oak

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bark is highly valuable for this purpose, but the most effective application is an ointment formed by the white of two eggs and a teaspoonful of alum mixed with sufficient hogs lard to soften them, stirred together and rubbed about the stifle. Let it be made to penetrate by heating with a hot iron.

Worms.—A horse will not be infested with worms if he is fed regularly with salt, and three times a week with a small handful of hard wood ashes. A frequent supply of a little salaratus would be found a preventative of worms, botts and cholic.

Wounds.—An unguent made of equal quantities of rosin and lard, or tallow, applied to fresh wounds, will prevent an animal taking cold in it, and will effect a speedy cure.

Corns.—Instead of mutilating the hoof by cutting or burning out these excrescences, it is better to take off the shoe and allow the horse to run to grass. This course is, I believe, always successful in effecting their extirpation.

Horse distemper.—This is a highly contagious distemper, but seldom fatal. A horse affected by it should be at once removed from all contact with others, particularly in feeding and watering. It generally occurs in the spring or fall, and is exhibited by a swelling of the glands of the throat, great soreness and difficulty of swallowing. A disagreeable discharge from the nose follows, attended by extreme debility. Feed the horse light, administer thorough cathartics, and keep him warm. If febrile symptoms are manifested, he should be bled. When the swelling is very severe and obstinate it is sometimes lanced, or a blister or other irritant may be applied.

THE ASS AND MULE.

The slight attention these animals receive in our husbandry is a subject of surprise and regret. They are generally regarded with repugnance. This feeling is partially excited by disgust at their unpleasant and discordant braying, but is more owing to an unjust depreciation of their value and utility. The low estimation in which they have been usually held, has been formed by a view of the very inferior animals which have commonly appeared among us. It has been too much the custom to cross small and uncouth Jacks with mares possessing the lowest qualities. The

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despicable progeny of such a cross is a most inadequate type of the sprightly and vigorous Mule, which should be sixteen hands high, with fine proportions. The European Jacks presented to Washington were of these dimensions, and they are not unusual in countries where the Ass and Mule are esteemed and cultivated with appropriate care.

The Ass is used for labor in most oriental countries and extensively on the continent of Europe. Wherever employed he is considered a most valuable animal for that purpose. His strength in proportion to his size far exceeds that of the horse, while he immeasurably surpasses the latter in his powers of endurance and the ease with which he is kept. In Persia and the regions bordering on the Levant, two distinct varieties of the Ass occur. The smaller and inferior class being devoted to labor, and the large and elegant variety appropriated exclusively for the saddle and driving. In Spain and Malta, (from which our choicest Jacks are now derived,) the same distinction appears to exist.

The Ass is capable of propagating when two years old, but should be retained until he attains greater maturity, a year or two later. The period of gestation with the Jenny is about eleven months. They uniformly produce one foal at a birth. The female is again in heat usually seven days after foaling. The colt should be weaned when about six months old. An Ass will live upon the coarsest food and endure the harshest privations, but like every other animal pays liberally for generous treatment. He is distinguished for remarkable longevity.

Morton says, "a good Ass should be of fair stature, as large in fact as you can find. The neck long, the nostrils wide, eye large and full, wethers raised—Asses are very apt to be deficient in this respect—back full and quarters large. A short tail, although perhaps not a beauty, is unquestionaby a characteristic of strength and vigor. Select both parents with equal care." The Ass is admirably adapted to every description of light labor. Its milk is esteemed highly medicinal in many diseases.

Mules are the progeny of a Jack and mare. A cross between a choice Spanish Jack and a thoroughbred English mare produces a very superior animal. The dam impresses the qualities of the horse pre-eminently on the Mule. The progeny of a horse upon the Jenny is inferior to the Mule in its valuable qualities as well as in its size and appearance. The foal from this intercourse is called a Hinney.

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The treatment of the mule colt and the general subsequent management are in all respects the same which should be adapted to the horse. The same disparity in the relative value of good and bad animals prevails in both tribes. In breeding Mules it is of the highest importance to avoid the use of the inferior Jacks which are so common in this country. If possible, the services of one of the imported Spanish Jacks or their descendants should be secured. In Kentucky, in which State the breeding of Mules has received great attention, it has been found where size has been the prominent object pursued, and very large animals have been produced, that they have proved to be deficient in strength and vigor of constitution. A medium size with concentrated forms and full muscular development, characterizes those which are esteemed the most valuable and efficient animals.

The prominent reasons for using Mules in teaming and farm labor in preference to horses are briefly exhibited in the following views: They live to a much greater age; a Mule has scarcely attained his matured strength at twelve years old, an age in which horses have commenced a rapid deterioration in value and usefulness; the average life of the Mule is about thirty years, but often at forty they are known to perform efficiently the most laborious services. A team of Mules will accomplish almost the labor of horses with a consumption of about one-third less provender. Within the last few years Mules have been extensively introduced into the teaming operations of the manufacturing district in which I reside, and are universally considered there more efficient and economical for that use than horses. Mules are subject to but few of the diseases which prevail, and are so destructive, among horses. Their hard skin and short hair render them less liable to be galled by the harness or affected by cutaneous diseases. They are said never to be infested by vermin. The hoof of the Mule is essentially a horny substance, and of slow growth, and hence his shoes are seldom cast or displaced in the position, but remain until worn out firmly on the feet. The vision of the Mule is much more quick and distinct than that of the horse, and therefore they are less liable to be shy or become frightened. They are sure-footed to a proverb. The mule excels the horse and emulates the ox in his steady and uniform efforts in labor. It is objected to Mules that besides their disagreeable braying, they are obstinate and slow, but these defects I believe may be overcome by gentleness and practice.

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If these various traits of usefulness are possessed by the Mule, the conclusion seems to be irresistible that his general introduction to the labor of the farm would be an important and most desirable improvement. The breeding of these animals is a subject worthy the serious and considerate reflection of the farmer. It is evident to my mind that Mules may be bred with less care and expense than horses, and that they will command a price nearly equal to that of an ordinary horse, while the demand for them is prompt and continually increasing.

Like all other hybrids, Mules are supposed not to possess the capacity of procreation, although numerous instances are recorded of individuals producing young.

SHEEP.

This animal, from the earliest period, seems to have been the companion of man. Domesticated in the earliest ages, sheep constituted the great element of patriarchical wealth and sustenance. They have, in every period of the world, formed one of the most important and available resources for the support and comfort of our race.

The opinion appears well founded, that in their original condition they did not possess those characteristics which now form some of their more valuable and essential qualities. The fine, soft and beautiful fleece, which has become the first consideration in estimating their value, is supposed to be a consequence of their domestication, and to result from artificial care and management.

The wool of sheep, which has suceeeded a primitive coarse and hairy covering, was doubtless gradually produced by a change in their natural habits and keeping. Vast modifications in the quality of the sheep may be traced in their authentic history, and are yet progressive under the influence of the same causes. Wild sheep are known still to exist in the remote regions and inaccessible mountains of Asia, where the dominion of man has never been established. They have been discovered among the fastnesses of the Rocky mountains upon our own continent, and undescribed breeds, are supposed to range in the unexplored wilds of Africa. These are all different varieties, and possess distinctive peculiarities.

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Innumerable kinds of this animal have been subjected to captivity, but it is not within my province to even enumerate these, but I propose only to notice briefly the varieties which are connected with or adapted for our own husbandry.

Modern naturalists have generally classed the wild breeds into the following generic arrangement: 1st. The Argoli, which are found in the elevated plains of Asia, in the regions of the Himalaya and Caucaucus, and spread to Kamtschatka. 2d. The Bearded Argoli, natives of the Steppes of Barbary and the mountains of Egypt. 3d. The Musmon, which inhabited some of the Asiatic mountains, and still exist in Greece and on several of the large islands of the Mediteranean; and, 4th. The Rocky mountain sheep of America, which range on that lofty sierra.

Opinions differ in reference to the question which is naturally suggested, from which of these sources have the domestic sheep of Europe been derived? The question is one rather of curiosity than utility, and cannot with propriety be discussed in this Treatise.

Wool-growing, which now occupies a prominent position in American husbandry, had acquired but slight importance previous to the war of 1812, although the embargo of 1808 may have excited its earlier impulses. The first sheep imported into any part of the territory, which is now comprehended within the United States, were introduced in the year 1609 into Jamestown, Virginia. These sheep had increased to about three thousand in 1648. The first importation into what now constitutes the State of New-York was in 1625, and in 1630 they were first brought into Rensselaerwick. It appears that the experiment was attended with little success, as the records attest that only sixteen sheep existed in 1643 in the colony, and they were so scarce seven years afterward that a bearing ewe was worth from $8 to $10. Sheep were introduced into the plantations of Massachusetts Bay in the year 1633, and seem to have increased with great rapidity.

Before the year 1812, woolen manufactures, except in the domestic circle, were virtually unknown in this country. Each farm usually contained sheep sufficient to afford wool for the use of the family. Cloth for their own consumption was fabricated at home and spun and wove by hand. The scanty flocks which existed at that period exhibited little affinity with the breeds which have since been imported and now predominate. I think that I can discern the origin of the sheep which were

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distinguished after the importation of the Merinoes as the Native sheep, in some of the local and inferior breeds which still prevail in several districts of England and Wales. The wool of the Native sheep was coarse and thin, their bodies small and light, legs long and naked, and the bellies destitute of wool. They were hardy, but wild and uncontrollable in their habits, and had probably been imported by the early emigrants, without much regard in their selection to the qualities or value of their wool. The mutton of these sheep was esteemed much superior in flavor and juiciness of flesh to the Merinoes, when the latter were first introduced. Popular sentiment indeed was for a time so prejudiced against the meat of the Merinos, that it was almost rejected as an article of food.

A breed of native sheep, peculiar in their habits and form existed at this period, but is now extinct, of which I have a clear recollection. They were called the Otter, I infer from their similarity in form to that animal. Their legs were very short, with long bodies and protuberant bellies, unwieldy from their structure and easily confined in their enclosures. They were unsightly in their appearance, but having finer wool than the other native stock, they made an excellent cross with Merinos.

Although the honor of introducing the Merinos has generally been conceded to either Chancellor Livingston or Col. Humphreys, a Mr. Foster, of Boston, has recently assumed that distinction, and asserts that he imported two ewes and a ram from Spain in the year 1793, several years anterior to the first importation of either of the original competitors. No practical benefits to the country resulted however from the sheep introduced by Mr. Foster.

The introduction of Merino sheep from France by Chancellor Livingston, and by Colonel Humphreys from Spain about the year 1808, formed a new epoch in our sheep husbandry, and created a deep and enduring source of national wealth. An animated controversy in subsequent years, was excited between those patriotic and distinguished gentlemen, in reference to their respective claims to priority in their importations and the character and qualities of their stock. Each was an instrument in conferring vast benefits upon his country, and is entitled to the warmest gratitude and applause.

Their importations continued through several early years of the present century. Chancellor Livingston first imported a

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buck and two ewes from the Ramboullet flock of France, and Colonel Humphreys introduced a flock of two hundred about the same time into Connecticut from Spain. No other individuals engaged in the introduction of these sheep, until the year 1809 or 1810, when Mr. Grove of New-York, and Mr. Jarvis of Vermont, imported large numbers, which were rapidly diffused through the northern states.

All these sheep were selected with much care and sagacity, and possessed great excellence. They formed the basis in this country of the Merino flocks, which become so universally disseminated.

In a manuscript letter of Chancellor Livingston, now before me, and dated 12th June, 1808, he expresses an estimate of his own sheep, in this strong and glowing language: "I have lately received a very fine ram from France, and send you enclosed a sample of his wool. I can boast a finer Merino flock than any other country can show, having had an opportunity of selecting them myself from the choicest flocks of Europe. The Merinos are generally small and ill-made, but mine, by great attention in selection of the breeders by those who had the charge of the national flock in France, and by my own selection out of that flock, for myself, have improved both in their form and size, without any change in the quality of their wool."*

Col. Humphreys made his selections from the finest sheep of Spain, and equal skill and care were exerted by Messrs. Jarvis & Grove in the choice of their importations.

About the year 1826 a large number of sheep were imported from Saxony chiefly through the efforts of Mr. Grove. These various importations of valuable and superior sheep constituted the foundation of our flocks.

When these facts are contemplated, in connection with the circumstance that American sheep have subsequently, and particularly during the last few years, been eminently improved by the introduction of new stocks from the finest folds of Europe by what we designated the Taintors, French Merinos, Silesian and Spanish, it may confidently be assumed that we possess sheep, in their individual qualities, and in the character of the masses, unsurpassed by the flocks of any other country.

Our climate is peculiarly favorable to the production of wool, and promotive of the health and thriftiness of the sheep.

* Letter to Elkanah Watson.

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The magnitude of the wool-growing interest, and its high importance to the manufacturing independence and prosperity of the country require no illustration. I can discern no attribute of a just policy that would foster the mere private interests of the manufacturer while it disregards the claims to protection of the producer of the raw material. Recent events seem, however, to indicate that the interest of the farmer is less considered in our national councils than the protection of the manufacturer.

The value and extent of this department of husbandry are exhibited by the census of 1850, which shows—In the Union 21,723,220 sheep, at the low price of $2; worth nearly 43½ millions of dollars, and yielding annually 52½ millions pounds of wool. In the State of New-York about 3½ millions of sheep exist, worth, at the above estimate, seven millions of dollars, and yielding ten millions pounds of wool. Notwithstanding this vast aggregate, more than 20,000,000 pounds of wool was imported in the year preceding June, 1854.

Although the price and demand of wool, from causes I need not here examine, are liable to frequent and severe fluctuations, I regard its production through a series of years among the most secure and lucrative pursuits of husbandry. This remark necessarily refers to those districts adapted for sheep ranges.

The great vicissitudes incident to the wool-growing interest, were strikingly illustrated by the events which occurred in the interval between the years 1808 and 1816, which embraced the public measures of the embargo, the war of 1812, and the peace. The first of these events may be regarded as commencing this great interest, the war which ensued excluding all importations of wool, stimulated the domestic growth of the article. Sheep rapidly increased, woolen factories sprung into existence, and the demand and ideal value of sheep expanded into an enormous inflation. Bucks of full blood sold freely for $1000, and grades in proportion. Wool of the best quality commanded in 1810 $1.50 per pound, and during the war reached a much higher figure, attaining, I believe, the extravagant point of $2.50.

Chancellor Livingston speaks of receiving $4 and $5 for the use of a buck to a single ewe. On the occurrence of peace the bubble burst, and the revulsion in the price and nominal value of the Merino was immediate and excessive. I have in my

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own recollection, an instance which exemplifies these facts. A buck lamb was purchased at $175, for which offers of $1000 were repeatedly refused; but in 1816, the same animal, when in full maturity and vigor, was sold for $12.

The Merinos of that period were, I think, inferior in many respects to the recent importations of French and Spanish sheep. They were smaller and yielded lighter fleeces, but probably produced wool of equally fine fiber. The staple of the wool was shorter and the legs and bellies of the animal were less perfectly covered with wool. I remember seeing in my childhood sheep from the "Convent flocks of France," as they were designated, which bore the sign of the cross burnt into their cheeks. These were fine animals, but as I bear them in my memory, would not compare with those imported in the present day.

Sheep are divided into the general arrangement of fine, long and middle-wooled. The plan I have proposed, will require a brief account of each variety known to our husbandry and a rapid examination of their respective merits and properties.

Although Spain has been generally considered the source of the modern Merinos, which have been so widely diffused in Europe and America, and form the basis of nearly every family of fine wooled sheep, their true origin is still involved in obscurity and doubt.

At the Roman invasion Spain was distinguished for the quality of its sheep, but even in that period she was in the habit of improving her flocks by importations from other countries. The term Merino, is supposed by some authors to refer to the sea and to indicate a foreign origin; by others it is imputed to a local name and title, and the inference is drawn, that the name was derived from the locality in which they originated, or were created by artificial breeding, as the "Leicesters" of England.

The fact is singular and interesting, that previous to 1439, fine wooled sheep were exported from England into Spain. In 1467, a licence was given by Edward IV., "to pass over certain Cotteswold sheep into Spain." A Spaniard, commending the quality of Spanish wool, towards the close of the sixteenth century, remarks, "it is so fine that it may vie with that of England." Spanish history records the circumstance of choice sheep being imported into Spain from Italy and Barbary. The conclusion seems obvious from these facts, that the breed of

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Merinos was formed in that country by a long course of careful and discriminating breeding, connected with a system of improvement, by infusing into their flocks new and choice blood.

The Merinos of Spain are thus described by a recent writer: "the wool lying closer and thicker over the body, than in most other breeds of sheep, and being abundant in yolk, is covered with a dirty crust, often full of cracks. The legs are long, yet small in the bone; the breast and back are narrow, and the sides somewhat flat; the fore shoulders and bosoms are heavy, and too much of their weight is carried on their coarser parts; under their throat is a singular looseness of skin, which gives them a remarkable appearance of throatiness or hollowness in the neck. The pile when pressed, is hard and unyielding, but when examined the fiber exceeds in fineness and the number of cerrations and curves, that which any other sheep in the world produces. The average weight of fleeces in Spain is eight pounds from the ram and five from the ewe."

The superiority of the Merino, consists mainly in the peculiar delicacy and fineness of the wool, and its singular properties of felting. The fleece should be firm and compact, but an extreme hardness of the surface is a bad quality. An excess of yolk, which communicates a yellow gummy appearance, is a defect. A white and clean fiber, with a soft and wavy texture, is desirable. The legs and belly should be well covered with wool. Where individuals exhibit a hairy or coarse growth about the flank, or an openness of the fleece, they should be rejected as breeders, if improvement in a flock is desired. The Merino is a vigorous feeder, and quite a hardy animal. Its heavy and compact fleece enables it to bear, with little prejudice to its health, the severe changes of a cold and wet climate, when proper care in their management is exercised.

The Ramboullet flock of France, from which originated many of our choicest sheep, has generally been esteemed superior to the ordinary Spanish Merino. This flock, which is under the care and direction of the government, was commenced in the year 1786, by the importation of 376 ewes and lambs from Spain. Ten years afterwards the average yield of the fleeces was only six pounds and nine ounces in the yolk, but care and skill in the succeeding five years had raised the average to nine pounds.

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This flock has been cherished by the French government with the greatest solicitude, and the most accomplished science has been applied to its management. A practical school was established by the State, at Ramboullet, in connection with this flock. A British writer in 1827, speaks of this sheep "as the largest pure Merino" he had ever seen, and alludes to one characteristic which distinguishes the recent importation of the French Merino. He says, "individuals of this flock have dewlaps almost down to the knees and folds of skin on the neck like frills, almost covering the head. Several of these animals seem to possess pelts of such looseness and size, that one skin would nearly hold the carcasses of two such sheep."*

The Silesian sheep are another infusion, which have been recently introduced into this country with the view of improving the original Merino stock. These sheep possess many excellences; are hardy, carry a heavy fleece of pure and white wool, and are not characterized by the looseness of the skin which distinguishes the French Merino, but have usually a smaller frame. This breed was formed by a skilful crossing of an original Silesian sheep, peculiar for its great vigor of constitution and bearing fine but light fleeces, with the Spanish Merino. This process was commenced in the year 1767, by private enterprise, but in 1786, the system was adopted and pursued by Frederick the Great. Since that period sustained and fostered by the Prussian government, the highest skill and care have been exerted, for improving the qualities of the Silesian sheep. They have now reached great perfection, and some of the choicest sheep of late introduced into our flocks, are selections from these folds.

The Saxon sheep, although originally formed from the Spanish Merino, have been so modified by management and art, that they now occupy almost the position of a distinct breed. Previous to the year 1765, the sheep of Saxony consisted of two varieties, one of which possessed some degree of fineness of fleece, but the other was exceedingly coarse. In that year, Spanish Merinos were introduced by the Elector, who made the improvement of sheep in his dominion a prominent object of State policy. The repugnance and prejudice which seem universally to have prevailed in the popular sentiment, on the introduction of these sheep, were so powerful in Saxony that it be-

* Trimmer's Observations.

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came necessary for securing the propagation, to issue a decree compelling every breeder to purchase a specified number of these Merinos. This feeling rapidly subsided, and a breed of sheep, by science and vigilance, was soon created, and generally diffused in Saxony, which has no superior in the fineness, beauty and delicacy of the texture of its wool. In no country has art and science been applied to the improvement of stock with superior zeal and industry, than was exhibited in Saxony in the melioration of their sheep. The most indefatigable care is exerted in preserving the purity and to promote and enhance the qualities of their flocks.

The following, in connection with other equally vigilant measures, are pursued to affect these results: "When the lambs are weaned, each is placed upon a table, that his wool and form may be minutely observed. The finest are selected for breeding, and receive a first mark. When they are a year old, another close examination of those previously marked takes place; those in which are found no defect are preserved, and the rest condemned. A few months afterwards a final scrutiny is made; the fine ewes and lambs receive a third mark, but the slightest blemish is sufficient to cause a rejection of the animal."

The results of this system in Saxony enforce with great emphasis the influence of care and caution in selecting breeding animals. By these practices an exquisite fineness of wool has been attained, but, I believe, although the opinion may be opposed by some breeders, at the sacrifice to a considerable extent of the vigor and constitution of the breed. The fleece of the Saxon sheep is short and light, and yields a much lower average in weight than the Merino, but of a finer and more silky fiber.

In the English market the price of the Saxon wool has often exceeded by nearly 100 per cent that of the finest Spanish Merinos. At the present the former still ranges much the highest in market.

The Saxon sheep is generally lighter in its frame than the Spanish Merino, and has a more delicate formation, with a smaller bone. These qualities, combined with the short and light fleece, render it more liable to be injuriously effected by our harsh climate and its sudden changes. The Saxon is less hardy than the Spanish Merino, will not thrive on the same food, and in the winter requires greater care and watchfulness. They are generally esteemed poor nurses, but the prevalence

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of this defect is often denied by their advocates. Without intending to agitate any controverted question, I may remark that I believe the Saxon sheep are now less esteemed than they were at one period. These varieties constitute the chief elements of the breed of fine-wooled sheep propagated in this country, especially for their wool.

The New Leicester, or Bakewell, may be classed among the most prominent and valuable of the long-wooled sheep. Their history is interesting, as it affords an impressive exhibition of the results which the application of science and intelligence to husbandry may accomplish. Precisely one century ago Bakewell, guided by great intelligence and keen observation of the laws of nature, commenced his system by which he formed a breed of sheep that will perpetuate his name. The Old Leicester, upon which he founded his operations, were large, coarse-boned and unseemly. By perseverance and skill he formed from these in a series of years a new variety of animals, distinguished for their great perfection in form and beauty, and various other excellent qualities. Unhappily, he veiled in great mystery the means by which he accomplished these results, and we are left mainly to mere conjecture on the subject.

The admirable symmetry of these sheep, their early maturity, small bones and great inclination to take on fat, are claimed as their distinguishing advantages. Their wool is very long, but the fleece is light in proportion to the size of the animal and the expense of keeping. The mutton they afford is excellent, if an excess of fatness to which they are inclined is avoided. They are delicate in constitution, and not prolific. The young are tender and difficult to rear.

In the formation of the Saxon sheep, every other object was sacrificed to attaining great fineness of wool, but Bakewell made all other purposes subordinate to beauty, symmetry and delicacy of mold in the New Leicester. Even great size, an essential characteristic generally in long-wooled sheep, he disregarded. His successors, however, have in this respect improved the breed.

These sheep, and the remark applies universally to the class of long wooled and large bodied sheep, require far richer and more luxuriant pasturage than is necessary for the thrift of most small sized sheep.

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The Cotswold, is another valuable variety of the long wooled English sheep, which have been in the last few years extensively introduced into this country. They are larger than the Bakewell, possess more constitutional vigor, and yield better wool and heavier fleeces. The Cotswold were amongst the most ancient British sheep, whose history is established. These seem to have differed in some prominent characteristics from the modern sheep of the same name. Those known to us as the Cotswold have I conjecture a strong infusion of the Bakewell blood.

The Oxford is a member of the family of long wooled sheep, was recently imported, and is superior to the Bakewell in size and length of fleece. These sheep possess majestic statures, and wool of great length, eminently adapted for combing purposes. Both the Cotswold and Oxford are more prolific than the Bakewell and better nurses, and have more hardiness and endurance. The wool of all this class of sheep, is not calculated for felting or the manufacturing of fine cloths, but coarse, long and lustrous, is admirably suited to the fabrication of worsted goods. These fabrics are annually becoming with us more important and extended departments of manufactures. The production of this grade of wool will be therefore more required, and its price and value will continue to constantly augment. The Cotswold not unfrequently yields fifty pounds of mutton to the quarter.

The South Downs are the most conspicuous middle-wooled breed and occupy an intermediate position between the long and fine wooled sheep. They must prove a most valuable acquisition to our flocks. The South Downs are of ancient English origin and derive their name from a district of chalkey hills in the midland counties of England. They have received however their impress of great superiority in a recent period, through the efforts and scientific management of Mr. Ellman, who like Bakewell devoted great intellectual energies and perseverance to the purpose. The South Downs now rank for hardiness of constitution, beauty of form and combined value of wool and carcass with the best sheep of Europe or America.

These sheep since 1780 have been in progressive and rapid improvement, and the late importations of the breed exhibit a race of animals, of unsurpassed excellence. The mutton of the South Downs has a reputation with the epicures of London that commands for it in the Smithfield market a price far be-

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yond that of any other breed. This superiority consists of a union of flavor, of rich juiciness and a marbling of fat with the flesh, which is highly luscious although free from grossness. Their meat in England usually averages about 20 lbs. to the quarter, but they often attain twice that weight.

The South Downs have a large frame, but smaller than the Bakewells, are hardy, prosper upon light pastures, and winter well with ordinary keeping. They are remarkably prolific and easily reared. No sheep are more healthy, and they are exempt from many diseases to which less vigorous flocks are liable. They attain early maturity and yield besides the general dissemination of fat through the meat, a large mass of rough tallow.

The South Down is hornless with a mottled or grey face, and should show a broad and straight back, a wide chest, a full and bright eye. Its legs and belly should be well covered with wool and the legs of a medium length. The wool is shorter and finer than that of the Bakewell, is compact, firm, even and free from hairy fibers. Its market value is probably about equal to half grade Merinos.

The South Downs yield an average fleece of about 6½ pounds. No breed of sheep exact less care and vigilance in their management, either in summer or winter. Their habits are eminently domestic, docile and quiet. I indulge in fuller comments upon the character and qualities of these sheep, because I entertain a strong conviction that they are destined to hold a prominent attitude in our sheep husbandry.

Numerous other varieties and distinct breeds of sheep, occur not only in Europe but in Asia, whose introduction may be desirable, for the purpose of imparting a peculiar property of some value which they may possess to our own flocks. The Cheviots of Scotland, are a highly valuable breed, and have large carcasses and good wool, combined with great vigor of constitution and endurance of privation. They range upon the mountain regions of Scotland, and would doubtless be found peculiarly adapted to the colder and loftier districts of our own country, which possess analagous characteristics of climate and forage.

The Dorsets are an old and celebrated English breed, and are distinguished for some highly valuable properties. The wool is short and of a good fiber, and the mutton of a medium quality. They are hardy, easily kept and possess remarkable fecundity.

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The peculiarity, however, which might render their introduction into this country highly desirable, consist in the circumstance of the ewes receiving the buck in May and June. The lambs being dropped in October and November, are in killing condition during the festivities of Christmas and New Year, and hence command exorbitant prices. In their native district while the younger ewes are put to the Dorset ram, to perpetuate the breed, the old ones intended for slaughtering are turned with a South Down ram. The progeny forms a superior and more thriving lamb, and better matured than the pure Dorset, and is earlier ready for market. These facts are worthy the consideration of the sheep breeder.

Crossing.—No incident in stock husbandry demands an exercise of more discriminating judgment and skill, than the judicious and appropriate crossing of sheep. The general principles of breeding, to which I have before adverted, will be applied, but besides these peculiar considerations adapted specifically to sheep, must be regarded. The inexperienced breeder is often inclined to think that the distinctive excellences of various classes, may readily be combined in the formation of a perfect animal. Such a hypothesis, if acted upon, must lead to disastrous results. He will greatly err, if he suppose that early maturity, aptitude to fattening, size, symmetry, great length of wool, and extreme fineness, can be united in the same animal. Some of these properties must be sacrificed to the attainment of the others. Breeds may be immensely improved by a judicious crossing, and great temporary advantages may be gained by admixture of blood; but to make it permanently beneficial, some fundamental rules must be observed. Amongst them may be suggested an affinity or harmony of qualities. Thus a stock of fine-wooled sheep may be decidedly improved by a cross with a breed that possesses these qualities in a superior degree. The Ryelands were the prominent fine-wooled sheep of England when the Spanish Merinos were introduced into that country. These breeds were marked by some common properties. They amalgamated favorably, and the Ryelands formed an excellent medium for the general diffusion of the Merino blood. The progeny of this cross embraced many characteristics of the two breeds, and improved the general character of the stock. The Merinos impressed an increased fineness and beauty on the fleece, while the Ryeland imparted an augmented vigor and hardiness to the constitution. For the same reason, the Merinos crossed advan-

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tageously with the native sheep which existed in this country at their introduction.

The South Downs and fine-wooled sheep may be combined without doing violence to any established law of breeding. Although the fineness of the fleece may be decreased, the quantity will be enhanced, and a great improvement achieved in the size and form of the animal and the quality of the mutton. The same affinity, which I consider should be the basis of crossing, exists in the various branches of the long-wooled sheep. These may be crossed successfully to attain some contemplated improvement. I do not, however, believe that a long-wooled and fine sheep can be amalgamated in reference to the production of a permanent stock with satisfactory results. The issue of my own experience in crossing a Bakewell buck with Merino ewes was entirely unfavorable. Although the size of the sheep was increased, the beauty and symmetry of the male was lost. The quality of the wool was somewhat improved, but the fleece was light, open and thin, and decidedly inferior to the Merino.

A cross between the South Down and the Bakewell, or Cotswold, undoubtedly improves both the wool and carcass in the immediate offspring. The object proposed to be gained by this system should be distinct and fixed, but an indiscriminate crossing of breeds, with no reference to the result, is in the highest degree injudicious. If the farmer desires to produce in his flock the peculiarity of an enlarged carcass, with a view to the production of mutton, and is willing to sacrifice to that end the quality of his wool, he may introduce the blood of the larger and coarser breeds. If he proposes to improve the quality of the wool, he must observe the opposite practice. He cannot secure both, and should remember that antagonistic qualities cannot be incorporated and mingled in the same animal. He cannot, by any system of crossing, form a sheep that will unite the fineness and delicacy of the Saxon's wool with the length of fiber of the Merino, and in the fleece the dimensions of the Cotswold. Policy as well as taste admonishes us to avoid a careless and indiscriminate mingling of breeds. It is far better to give our flocks a distinctive character.

The great purpose and peculiar utility of crossing are accomplished, however, by the improvement of the same breed or family of animals. This object is attained by the impression of the particular excellence of an individual upon a stock, or the correction of some characteristic defects. The predominant imperfections of a flock may be coarseness or openness of the fleece, or

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the fiber may be too short, or the wool may be affected by an excessive gum. The observing breeder will promptly perceive and appreciate these defective features, and apply the remedy by the infusion of blood that eminently possesses the qualities in which his own flock is deficient. One crossing is not sufficient to change the character of a flock, but if success would be ensured, the system must be pursued with perseverance until the impression is firmly enstamped. After the lapse of several generations the intelligent shepherd will frequently notice an exhibition of some of their original features in his flock. I impute to this influence the occasional development in an individual from a flock of choice fine sheep, of a coarse and hairy covering on the belly and flanks, which was characteristic of our former native sheep. To this cause may be assigned the incidental appearance of a black lamb from white parents.

Physiologists generally concur in the opinion that the ram exerts the most influence in giving his character to the wool of the progeny, and that the internal construction, and consequently the form, is more dependent upon the dam. This theory, if based upon correct principles, furnishes an important rule for the guidance of the breeder. The improvement which may be communicated by the male it is obvious can be more readily and generally diffused than that depending upon the ewes. The latter can alone be accomplished by the selection of animals possessing the appropriate qualities, but that topic strictly belongs to another department of sheep husbandry. If it is intended to augment the size of a diminutive flock, without improving their blood or the quality of their wool, the individuals which possess the least of this defect should be selected as the basis of the proposed improvement. The broadest chest, the most capacious abdominal development, and the deepest loin, should characterize the ewes preferred. Apply to such ewes a buck of a large size, and marked by the same qualities, although, as a general rule, a very large buck should not be coupled with a small ewe.

When I speak in this connexion of a large sized sheep, I do not refer merely to a stately and majestic stature, but to one of a massive frame, with the physical energies and capacities fully developed. When the crossing is in the same breed, the families should be as distinct as possible. Sheep originating in distant districts of the same country are usually endowed with different qualities, and these may often, even of the same blood,

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be favorably combined. Climate, forage of summer, management, winter keeping, each exerts a powerful influence in impressing character upon all animals, and most especially upon sheep.

The efficiency of this method of improving stock, was singularly illustrated by the practice of Bakewell. It is supposed that he never extended the sphere of his operations beyond the range of the Old Leicesters, which formed the foundation of the new breed he created. The strictly in and in system it is suggested was probably adopted by him after his flock had attained a degree of perfection which could not be advanced by any cross breeding.

The comparative advantages of different breeds.—It is apparent that the choice of stock must be controlled not only by the special wishes of the breeder, but by his position and other incidental circumstances. The price and demand of wool, the value of mutton, the advantages and accessibility of market, and the nature of the range to which sheep will be limited, are all important considerations which should influence a decision. When wool is at a high price, the inducement is strong for the breeder to devote his flock to the production of the fleece as the paramount object in his husbandry, and he zealously pursues that purpose. In the presence of different circumstances, his plans will be modified to meet them.

It is known, and the fact constitutes a permanent objection to wool growing, that both the price and demand of wool are exposed to excessive fluctuations. Farmers are prone to suddenly change their plans under the pressure of these vicissitudes, and pursue the false policy of selling off their flocks when wool is low and sheep depressed in value, and purchasing when the price of both are high. Experience, I believe, warrants the opinion that wool rarely falls and remains below remunerative prices. At its ordinary value few rural occupations are more profitable than wool growing. The breeder should be content to submit to occasional depressions, persevering in his course and improving his flock amid these temporary adversities. Fine Merino wool, during the last twenty-five years has fallen as low as twenty-five cents only in a few seasons, and has occasionally reached as high a figure as sixty cents per pound.

It will be extreme folly to abandon a valuable flock of choice fine wooled sheep, or those adapted for producing mutton,

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which have been formed by the care and skill of many years, under the occurrence of unfavorable returns for a brief period and adopt a different breed, which will be liable soon to be subjected to the same adverse changes. When our schemes and designs have been deliberately formed, they should not in this or any other pursuit of agriculture, be diverted or arrested by any slight or temporary cause. Stability and perseverance are virtues in every vocation. The advantages of sheep husbandry are so many and varied that a close calculation will demonstrate to the breeder, that he may avoid loss by selling his fine wool at a much lower figure than he imagines.

The Merinos in their various branches and the South Downs delight in a wide range of pasturage, where they may pluck a scanty herbage on the acclivities of mountains and hills, and among the crevices of rocks. They will graze and fatten where no other domestic animal save the goat can follow. They thrive upon a sandy barren, on which few other animals could scarcely sustain life.

The Bakewell, on the contrary, are not adapted to locomotion. They have no ability to clamber amid rocks and precipices, but alone prosper upon rank and luxuriant pastures. The former are calculated for tracts which will support no other stock, while the latter will thrive only upon rich and fertile lands. Broken and cheap farms may be appropriated to the smaller breeds, but land generally esteemed in most localities too valuable for sheep grazing is required for the larger varieties. Ranges such as the first and districts remote from markets, should then be devoted to the growing of fine wool.

If this product is the primary object, I cannot hesitate in adopting the views of an intelligent and veteran wool grower of Vermont,* who says, in a letter to the author, "For wool, the Spanish Merino are *the* sheep for the wool grower. This breed you know has become nearly extinct by the introduction of the Saxons. All are now convinced, that fine light fleeces cannot now be profitably produced here. We must then bring back our flocks to the standard of the Merino in 1820, before the introduction of the Saxons. It seems to have been the opinion of some, that breeding from a black oily buck, without regard to other characteristics, would accomplish this object. I think it will be found that this practice has been injurious to the interest of the wool grower."

Hon. J. S. Pettibone.

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The facilities for transportation which now exist, have widely extended the area in which mutton may be successfully produced for market. When this exclusive object is contemplated in sheep husbandry, the choice rests among the several breeds peculiarly adapted for this purpose. If the breeder proposes as far as practicable to combine the advantages of wool and carcass, I think the South Downs and their crosses with the Merino should be selected. I have already referred to the quality of this wool. The mutton of the grades is far superior to the meat of the pure Merino or Saxon. If the location is such that the demand for the choicest and most delicate mutton, which will command an enhanced price, may be regarded, then unquestionably the South Downs should be cultivated. On the table of the English epicure, it excludes all other mutton, and of course commands a highly augmented price, and such will be the result in this country when they are known and appreciated. The South Downs will then be widely grown for this peculiar purpose.

If, however, a large carcass, with a high degree of fat, without much reference to delicacy, is desired, the Bakewell, Cotswold, and other kindred breeds will be preferred. A cross between the Bakewell and South Downs, will be found very profitable in producing early and choice lambs for market. They are superior in the quality of the meat, and weigh heavier, while the ewes of either breed are more prolific and better nurses than the Merino or Saxon. In deciding these selections, another important consideration should be regarded.

It is now generally conceded that sheep consume fodder both in summer and winter, very nearly in proportion to their weight. If this calculation is correct, it follows that a New-Leicester will, on an average, eat about three times the quantity of food necessary for a Merino, and its cost at maturity will be three times greater. The wool is much less valuable, and the product I think usually not proportionally increased. In locations where land is high and fodder expensive, these circumstances will demand serious reflection.

The fine wooled sheep, and especially the Saxons, are comparatively bad breeders, both as to fecundity and the care of their young. The South Downs, and measurably the Cotswold, are remarkable for their good qualities in these particulars. No general directions upon this subject can be adapted to every case, but these glances at the considerations which should be

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contemplated, may be suggestive of views which will aid the novice in forming his decision. Whatever breed is selected, be governed in your choice by this prominent idea; let your flock be formed as far as practicable, of individuals which possess qualities of the highest excellence.

Breeding.—In discussing the general principles of breeding in preceding articles, I have anticipated many suggestions which appropriately belong to this department; but numerous views, and more than my brief limits will allow me to examine, remain, which are particularly connected with sheep husbandry. On breeding necessarily depends the character and qualities of a flock, and its deterioration or improvement, will result from the exercise of care or neglect in the breeder. This gives character to a flock for fleece, both in its fiber and weight, the form and size of the animal, and the quality of its mutton, and its health and vigor of constitution. Bakewell and Ellman are conspicuous instances of the results that attend the application of mind and perseverence to this subject. The ordinary farmer, although he may not be able to apply to the improvement of his flock, their energy and resources may be stimulated by their examples. The Ramboullet flock was raised by careful breeding in the term of a few years, from an average of 7 lbs. of unwashed wool to 12 lbs. per head. In my own experience I have seen flocks formed from the cast off cull of other flocks, and yielding scarcely 2 lbs. to the animal, in the exertion of skill and vigilance almost tripling, after the lapse of a few seasons, their yield of wool, and attaining a great pre-eminence over the very flocks from which they were derived. The ram is necessarily the first and chief agent by which these transformations are effected. I will briefly explain what I consider constitutes the characteristics of animals of superior excellence, and judicious management in breeding.

The Ram.—Great regard should be paid, no matter to what breed he belongs, to the size, and general contour and form of the buck. His structure should be firm and massive, with a broad and capacious breast, without a disproportionate length of legs, well formed and fully developed quarters, especially the hind parts. His loin should be stout and well knit; his features bold and masculine. A firm and muscular neck is very desirable; a courageous mien and eye are indicative of spirit and vigor. The head should be long, but rather small and finely molded. These appearances mark excellence in

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the rams of every breed. The different varieties should possess their distinctive traits. Great size, in the Merino buck, should not be the paramount consideration, although this feature may not be disregarded. His legs should be short, but with a small bone, and thoroughly wooled. His skin should be of a soft and rosy color, resting loosely on the flesh, especially about the neck. When it forms in folds, particularly on the neck, it is recognized as a favorable evidence by the prevailing taste. The wool should be as equal as possible in fineness of fiber over every part of the body, and be exempt from all coarse and hairy appendages about the flank and belly. The legs and belly should be abundantly supplied with wool of a good length and quality. The fiber should be long, curling or spiral, and elastic, and the fleece firm and compact, and when opened exposing a pure and brilliant appearance, having an abundance of yolk, but free from a yellow gummy substance, which is sometimes mistaken for an evidence of high breeding. The surface of the fleece should be firm, and resisting to the pressure, but bucks should be avoided that exhibit hard, twisted, or wiry extremities of the wool. The natural color of the surface should be dark, but I am unable to conjecture any possible utility or improvement to the blood or qualities of the sheep by the communication to them of this tint by artificial means, nor can I conceive that the breed of sheep can be improved by saturating the fleece with preparations of oil or fat. I shall in another place refer to the practice of anointing sheep after shearing.

In the purchase of an animal he should be regarded as he appears in his normal condition. It is unsafe to rely upon the form or appearance of a sheep, when these have been created either by external applications or high and unnatural forcing. The progeny of such an animal is more likely to be injured than improved by these appliances.

The high bred Merinos are apt to be defective in the form of the loin and hind quarter, which frequently fall down very abruptly. This gives them a diminutive and ungainly appearance. Those should be preferred which have a straight and well formed back.

The selection of the Saxon buck is governed more particularly by the quality of the wool and less in reference to the size and form of the animal; these, however, should not be disregarded. He should be symmetrically built, with a great

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delicacy of frame and bone. Fineness and purity of wool, with as much compactness of fleece and length of fiber as possible, should be required. Proportion and symmetry are considered important elements in the South Down and the large breeds, as indicative of hardiness of constitution and aptitude to fattening. British writers enumerate the following features as affording evidence of excellence in the males of the South Downs: The head should be of medium size, the lips thin, the head well covered with wool, the eye full and bright, the neck of good length, thin near the head and enlarging towards the shoulders, where it should be broad and straight. The shoulders should be on a level with the back, and not excessively wide, and the back flat from the shoulders to the setting on of the tail. The ribs should project horizontally from the spine, and extend far backward. The legs should be of proportionate length and straight.* I give the substance of the above description from an eminent English authority, because the great perfection the South Downs have attained in England enables them to speak on the subject with intelligence and emphasis; and yet I believe we now possess individuals, and even flocks, of this breed which would illustrate the description. I may add, that a very marked disparity exists in the quality and weight of fleece. In selecting a buck, therefore, great attention should be paid to the length, cleanness and compactness of the wool. I have seen South Downs whose yield of wool was extremely light in proportion to the size of the animal.

The same authority, whose views I adopt for the reason just assigned, presents the following portraiture of a perfect Bakewell sheep, which peculiarly applies to the male: He should have a small head, covered with short white hair, an open countenance, a clean muzzle, a full yet quick eye, a long, thin and well placed ear, a full but tapering neck, a deep and wide chest, uniformly a broad, straight and firm back, with a square rump and full deep shoulder, well arched ribs and light offal; a long full quarter, a small bone, a thin, soft and elastic pelt, with mellow handling. These constitute the elements of a perfect Bakewell, and we may, without hesitation, assume that our annual fairs afford exhibitions of animals that possess all these qualities. The wool of the Bakewell buck should be long and thick, presenting a wavy and silky appearance.

* Morton's Cyc.

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The same rules may govern in the choice of the Cotswold, Oxford and kindred breeds, although a higher consideration should be given in these breeds to a majestic and massive size, united with due symmetrical proportions.

Much difference of opinion exists in relation to the age of a buck, the most favorable to successful procreation. They may be used at a very early age and until a late period of life. Lambs of a few months old are capable of procreating, indeed I have known instances of ewes being impregnated by their own lambs before weaning in autumn. Aged bucks are sometimes used and produce healthy offspring, but I think this result cannot be relied on, and is rather the exception than the rule.

The animal should be in full vigor and neither decrepid nor immature. In my personal experience I have found bucks from two to four years old most reliable and successful, as well in impregnating the female as in the character of the offspring. In England, it is not esteemed judicious practice to put old ewes to what they designate a shearling buck, or one that has yielded only a single fleece. They do not consider him possessed of full vigor or maturity. We often err in using bucks which have not reached their ripened strength, and when used they are frequently allowed to exhaust their energies by an unlimited indulgence or by tupping too large a number of ewes. Three bucks to one hundred ewes is about the proper proportion when they are turned loose into a flock without restraint, although with proper management, they have the physical ability to serve a far greater number. If left to his inclinations a buck will often follow for hours and exhaust himself on the same ewe. Shepherds consider one or two tuppings all that is necessary for impregnation, and others an unnecessary exhaustion. When circumstances render it desirable to extend the services of a particular buck among a large number of ewes as possible, a second buck should be turned into the flock, secured by an apron around the body. He will readily detect the ewes in heat, and these after being served by the favorite buck, which should be confined in a contiguous pen, may be removed to another enclosure. It is said that a buck in good condition may by this arrangement serve from one hundred and twenty to one hundred and fifty ewes, although one half that number would probably be the safer limit.

The brisket of the buck should be painted on his being turned into a flock, and the paint be renewed every second or third

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day. By this means the breeder is able to keep trace of the progress of the buck, to know the barren ewes and those which return to the buck a second time. If they are not with lamb, ewes will be again in heat between the second and third week, but if they return the third time, they may be considered barren and should be designated as such by an understood mark. When the tupping season is closed the buck should be removed from the teeming ewes. He is prone to tease them by his solicitation, and often injures them by blows with his horns, and these give him an undue advantage in feeding, either at the rack or trough. For these reasons many breeders prefer polled bucks, but I confess my preferences are for the stately horns, not merely as an element of beauty in a flock, but also as a ready means of discerning the buck and an evidence of strength and vigor.

The buck, when the tupping season arrives should be in a good condition, but not made indolent and inert by pampering or excessive fatness. They are by this extreme rendered inefficient and worthless. It is of the utmost importance to the improvement of a flock, that the buck if possible should be superior in blood and general properties to the flock into which he is turned; if the converse practice is pursued, rapid and certain deterioration of the stock must follow.

Wethers should not be suffered to mingle with a flock of ewes during the tupping season. They always fret and hunt those in heat and disturb the ram. I have known instances when a shepherd has not been watchful, of a bold and powerful wether attaining a mastery over the buck and repelling him from the ewes, and thus entailing a loss of the entire increase of a flock for the year. It is well to feed the buck previous to and during the period of tupping, a small supply of grain, equal to about two gills of corn per day. This will invigorate his virility, and tend, as many breeders think, to impress his peculiar qualities upon the progeny.

Ewes.—Similar rules apply to the female in selecting her in reference to the wool, which have been pointed out in connection with the buck. Delicacy and just proportions are more esteemed in the ewe than size and muscular development. As a breeder, she should be marked by a wide and capacious barrel, broad hips and hind legs spreading and placed wide apart. Docility and gentleness are desirable, as they render her more manageable while teeming and sucking. A perni-

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cious custom prevails of putting ewes to breeding before they have attained maturity or strength. She should never produce a lamb before her second year, and it is better to delay until the third year. A young ewe has seldom a sufficient supply of milk, proves generally a bad nurse and usually produces a feeble lamb. Her growth will be retarded by pregnancy and much more by sucking. Some breeders allow ewes to come in at one year old, under the mistaken impression that by this practice they make subsequently better mothers, that the pelvis is expanded and future yeaning is thus made more safe.

The common period for turning ewes with the buck in this climate is about the 1st of December, and they remain with him from three to four weeks. This brings the lambing season into the corresponding time in May, as ewes run with lamb about five months. Mr. N. J. Purdy, of Vermont, an experienced breeder, remarks in a communication from which I shall again quote, that "I have better success with my lambs dropped in April than May, the cold of the former not being so injurious as the frequently wet weather of the latter month." Under ordinary circumstances it is advisable to withhold the young ewes from the buck until the last, thus giving them a few days longer in the spring to recruit their flesh and strength before lambing.

The vigilant breeder will know the character of his sheep, and ewes which have proved to be usually barren, have been found to be deficient in milk, or habitually negligent of their young, should not be used as breeders. These peculiarities are not rare, especially among fine-wooled sheep, and individuals possessing them, if the object is breeding, should at once be consigned to the butcher. Such also should be the fate of any which exhibit defects of form or unfavorable qualities of wool.

Ewes should be kept during the winter separate from all other sheep. Their general treatment during that season will be noticed under another head, but I will here remark, that they then require augmented care and additional feed. Judge Pettibone states that, "besides the ordinary fodder given to other sheep, I provide my breeding ewes daily with eight quarts of corn to a flock of one hundred," and Mr. Purdy "begins about the 1st of March to strew daily a little corn in the salt troughs of his ewes." Succulent food, such as turnips, rutabaga, carrots or beans, may be given to breeding ewes with the greatest utility. The quantity supplied of these ingredients

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to sheep need only be limited by the resources, as the breeder may be assured that while they are eminently useful to the ewes, the saving of hay will be in proportion to the amount of such fodder they consume.

Ewes with lamb should be handled with great caution and delicacy, and not exposed to crowding or jamming, as occurs in passing through a door, or leaping bars, or fences partially removed. They should be guarded from every sudden fright, such as the attack of dogs. Heavy losses by ewes casting their lambs frequently result from these causes. Ewes should not be extremely fat at lambing, as this condition endangers the safety of the mother, and is not favorable to the offspring.

The parturition of sheep is generally severe, but they do not often require artificial aid. This is often injurious when attempted; nature ordinarily, in the brute creation, carries on her own processes the most successfully alone. The lamb, in a natural position, presents the fore feet projecting, with the chin upon and between them. Assistance may be necessary, particularly with young ewes, even in this presentation. This is performed by laying the sheep upon her side, and as she strains in her throes the shepherd should pull with a gentle but steady force by the legs of the lamb. The power applied it may be necessary to increase, but never except in the last extremity should the fœtus be violently wrenched from the mother. Inflammation of the womb or vagina, and dislocation of the hips, are often produced by indiscreet zeal in the performance of this office.

In cases of unnatural presentation, or mal-formed fœtus, aid is generally indispensable, and should be promptly applied before the organs become inflamed and swollen, and the strength of the mother exhausted. If the difficulty of labor is caused by the largeness of the head of the fœtus, which is frequently the case with young ewes, the hand should be carefully inserted into the vagina and the head clasped by the fingers, and by then drawing upon both the head aud feet, the parturition will be greatly facilitated. When unnatural presentation occurs, skillful aid is much more necessary. Many of these can be little aided by ordinary skill and require the most cautious operations of a practiced hand. A breach presentation is comparatively common and is perhaps the most difficult to manage, indeed the extraction of the lamb is almost impossible, until the position is changed. This is best accomplished by bringing forward the

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hind legs. To do this, let the ewe be rested on her shoulders, with the hind quarters elevated. This position has a tendency to withdraw the foetus into the womb; when the hand should be introduced and the legs brought forward. The operation should be performed as rapidly as possible to save the lamb from smothering in the water from the bag.

Some times the back or side is presented, when the fœtus must be pressed back, the legs reached by the hand and projected. A dead lamb often must be removed artificially. This can only be done by the introduction of the hand into the womb and withdrawing the fœtus mechanically. When, as frequently happens in protracted labor, the pains leave the ewe and she ceases her efforts, she should be excited by the application of some stimulating drink or cordial, as these symptoms if not speedily removed will be fatal to both mother and offspring. The neck is occasionally presented with head doubled back upon the body. This presents almost an insuperable difficulty, which can best be obviated by severing the neck. The ceasarean operation has been performed on ewes with success, but should be resorted to only as a last means of preserving a valuable lamb, when the case of the mother is nearly desperate. This is performed by making an incision in the belly of the ewe and another in the womb, and through them extracting the foetus and placenta. Great care must be used not to injure the intestines, and in sewing up the wound. I need scarcely remark that in all these practices the hand of the operator should be greased and that the work should be performed with great gentleness and caution.

The period of lambing calls for the greatest vigilance and untiring care. The immediate approach of labor is indicated by a restlessness of the ewe, pawing, seeking seclusion, lying down and extending her body upon the ground. When these signs appear she should be removed to a warm and dry place, and carefully watched without being disturbed. When the labor is natural and effective leave her entirely to herself. The ewe will generally run at once to the lamb and lick it, but if she is too much exhausted to rise, place it at her head. An examination should be early made of the bag and teats to ascertain whether the first is swollen and hard, and if the latter discharges freely. The first secretions which exude often harden and form an encrustation which closes the orifices. This should be carefully removed, and if necessary the bag should be reduced by pressing out the milk. If an inflammation or soreness appears

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the bag should be washed with some cooling preparation, as weak brine. If it has not been previously done, the wool on the bag and in the vicinity where it might obstruct or deceive the lamb should be removed. Lambs are often destroyed in consequence of swallowing locks of wool thus exposed to them, which collect in the stomach and bowels and obstruct the passage and produce final death. Little further care is requisite if the ewe owns and cherishes the lamb. She frequently, particularly Merinos, when in low flesh or young, disowns it. This rarely happens when the mother has an abundant flow of milk and the bag is not sore, but if it occur it can usually be overcome by a little discipline. The young must be lost or brought up by hand, unless it can be substituted for another lamb when the ewe is destitute of a natural supply of nourishment. Cossets are troublesome and difficult to raise, and seldom remunerate the expence and labor. The various modes adopted to induce a wayward ewe to own her lamb are familiar to the breeder. The ewe with her lamb should be confined together and separate from other sheep in a small pen. Let her be tied and held occasionally to allow the lamb to suck, and if strong he will often tease her into compliance. If she repels the approach of the lamb or attacks it, she should be smartly switched. The presence of a dog will sometimes excite the maternal feeling. It is often desirable to substitute a lamb for a lost one, or from other contingencies. This is a difficult measure, but is frequently accomplished by rubbing a new fallen dead lamb over the body of a living one and submitting the latter at once to the mother, or the skin may be taken off and the exchanged lamb covered with it. It is generally necessary to confine them together for a short time, as the lamb is apt to be shy of its adoptive mother and the ewe half suspects the deception.

If the lamb is weak and unable to find the teat, it should be assisted, and it is often necessary to discharge at first the milk into its mouth. When the ewe, although fostering the lamb, is without a full supply of milk, it should be partially suckled on other ewes which have an excess or have lost their lambs, or be fed with milk from a cow; that from a young and new milch cow is most congenial. Ewes, while yeaning or with feeble lambs, should be confined, if running to grass, to a small and open enclosure, and free if possible from ditches and streams with high banks. They are prone to secreto themselves, and often remain out exposed to cold and storms, and have a pas-

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sion for leaping streams and ditches. Severe losses often occur to the breeder from these causes, when adequate precaution is not exercised.

It frequently happens that lambs acquire the habit of pirating at large upon the ewes of a flock. They generally accomplish their thefts while the true lamb is sucking, and by this adroit practice are apt to avoid detection by the mother. Feeble lambs often suffer seriously from this cause, and when it is known to exist, the depredator and his mother should at once be removed from the flock. Unless strong reasons exist for a different course, ewes should not be continued in breeding after they are four, and at the extent, five years old. They not only decrease in the value of the fleece, while the risk in wintering is annually augmented, but the lambs of old ewes are usually weak and infirm.

Lambs.—Little remains to be noticed in reference to the treatment of young lambs. If the district is infested by foxes, tar upon the head of a lamb, or a red string about the neck, is a good protection against their attacks. Crows are frequently destructive to young lambs. They fasten on them when just fallen, or asleep, and tear out their eyes. I can suggest no other remedy, than the removal of the lambs from the vicinity of their assailants. Lambs should be separated from the ewes about the 1st of September, and confined with a few old and quiet sheep in a secure field, where they may be easily observed and protected. The feed should be of the most nutritious quality. An aftergrowth of clover is preferable for the purpose. It is very essential for the quiet and easy weaning of the lambs, as well as their thrift, that they should be placed out of the sound of the ewes' bleating. When the ewes are in a flush of milk from luxuriant feed, it is often expedient, lest their udders should be injured, to wean the lambs gradually. This is easily accomplished by admitting them to the ewes once a day for a short time. The buck lambs should be separated early in the season from the ewe lambs.

Docking and Castration.—Lambs should be docked and castrated when two or three weeks old. Some breeders are accustomed to perform the last operation only a day or two after the lamb has fallen. I believe this practice mistaken, as the lamb at that age can scarcely have attained sufficient strength or sexual development for the purpose. Ewe lambs, for an obvious reason, should be docked quite short, at the third joint of the

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tail, but it is advisable to leave the dock of the wether an inch or two longer. This distinction enables the different classes to be readily detected, and much facilitates the labor when they are to be caught for separation. Buck lambs in England are generally allowed to retain their perfect tails until a year old, under the impression that the preservation of them tend to invigorate the spine.

It is thought expedient to sever the tail at a joint, in order to promote a rapid healing of the wound. It is usually cut off with a knife, the operator pulling the tail, and thus stretching the skin. This mode is apt to leave the bone of the dock bare when the skin recoils from its tension, and thus retards recovery and inflicts much suffering upon the animal. The better way is to lay the tail in a natural position upon a block, and then place upon it a sharp knife or razor, which strike by a smart blow with a mallet. The tail, in this manner, is smoothly amputated with little pain.

Several methods are used in castration. An assistant should hold the lamb firmly between his knees, securing a hind and fore leg in each hand, with the lamb's back towards him. The operator then, in the usual mode, after first cutting off the end of the scrotum, proceeds to press out the testicles from it, holding them firmly in that position, and extracts them with his teeth, pulling upon each separately until the cord breaks. By another, which is generally esteemed an improved method, the operator cuts a small opening through the integuments of the scrotum on each side, sufficient to allow the passage of a testicle. He then presses them out and extracts them as by the other process. The only particular advantage of the last method is, that the wound inflicted is smaller and less painful. Still a third way is sometimes pursued. A longitudinal slit is made in the scrotum on each side, the testicle is pressed out and the cord scraped off; but the suffering of the animal is probably much aggravated by this method, without securing any particular benefit. When the castration is made with care, and at a proper season, little danger or inconvenience results from it to the lamb. Salt should be introduced into the scrotum, and as an additional security it is advisable in warm weather to make a slight application of spirits of turpentine about the wound.

A somewhat different practice is pursued, which I may conveniently notice here, in the castration of old bucks, although

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the habit is very much obtaining at present, of adopting precisely the same method as with lambs. The common method has been to simply tie a waxed cord tightly about the scrotum above and free of the testicles. This totally obstructs the circulation and in a short time the scrotum and testicles drop off. A modern method has been recently introduced from France, and has been used with both sheep and Neat cattle, but within my own observation has not been attended with signal success. The operator seizes the testicles and pushes them several times with violence up and down, in order to destroy the adherence of the membranes. When this is effected the cord can readily be perceived and is considerably tightened, this he grasps in his left hand, a short distance from the testicles, he then turns the testicle with his right hand and presses it forcibly upwards until its position is reversed. He then turns the testicle several times around until the cord becomes hard twisted. He pursues the same course with the other, and then to prevent the possibility of their becoming replaced he ties a cord firmly around the bottom of the scrotum. The circulation is thus entirely interrupted and in a few days the cord may be cut. It is evident although the fact is strenuously denied, that this harsh proceeding must add greatly to the torture of the animal. Old bucks are frequently lost by either of these operations.

The scrotum of both lambs and aged bucks sometimes becomes inflamed and swollen after castration, and occasionally suppurates. When this occurs the wound should be opened and made to discharge freely. If the lamb in docking bleeds profusely a string may be tied tightly near the end of the dock, which will arrest the hemorrhage, but it should be removed in a few hours. Sheep after being docked or castrated should occupy a field of soft grass, as their wounds are liable to be irritated or inflamed by lying upon a stubble or in the dust.

DISEASES OF LAMBS.

The most thrifty lamb is sometimes seriously injured by an excessive supply of milk, which is liable when taken in unnatural quantities to coagulate in the stomach, forming an indigestible mass that nature cannot remove. This affection is indicated by a well conditioned lamb suddenly becoming dull and heavy and often swollen, with its discharges of a milky color. Alkalies, such as magnesia or soda should be given in small doses several times a day and be followed by

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salts, while the mother should be milked or suckled by another lamb and removed into less nutritious food. A stomach pump may be successfully applied in these cases. Scouring is often fatal to young lambs. When it appears, the food of the ewe, if it has been green or succulent should be changed to dry fodder, hay or grain, and she should be copiously salted. If the attack continues, astringent drinks such as soot tea, or starch, or frequent doses of about two teaspoonsful each of prepared chalk with a few drops of laudanum should be administered, until the discharges cease.

Costiveness is another dangerous disease, which results usually from the food of the mother being too light, dry or astringent.

It is sometimes produced by viscid discharges collecting under the tail, becoming hard or tenacious and obstructing the passage. The vigilant shepherd will guard against the latter by carefully removing all such accumulations. When costiveness exists from other causes it may generally be corrected by the use of mild cathartics, or aperient medicines, as salts, oil or molasses mixed with milk.

SUMMER MANAGEMENT OF SHEEP.

Many of the suggestions in reference to pastures, their plans and arrangement, which would be appropriate to this head, have been introduced elsewhere. The proper adaptation of stock to the peculiarities of a farm is an eminently important consideration in its economy. The smaller breeds of sheep, as we have already stated, will prosper upon ranges which are adapted to no other stock except the Goat; and while Neat cattle often deteriorate both the quality and degree of pasturage, sheep will maintain it in a condition of constant improvement. The fact, however, should be strongly impressed on the inexperienced breeder, that sheep will not thrive on low and wet ground. A flock confined to such localities, with rare exceptions, become diseased and infirm. It particularly exposes them to attacks of the rot and foot-ail, which are among the most formidable diseases to which sheep are liable. I purchased, some years ago, a number of ewes from a flock which had been wasted by the prevalence of a mysterious disease. The farm they occupied was highly cultivated, but situated on low and damp land. The intelligent owner was compelled at length to totally abandon sheep husbandry. These ewes I removed from their luxuriant pasturage to a pine plain, and they became at once thrifty

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and vigorous, and exhibited no subsequent appearance of any infirmity.

Sheep should be turned out early in the spring, or as soon as they can obtain a comfortable sustenance without being compelled to gnaw the vegetation so close as to injure the roots. Economy suggests this course, as every practical farmer knows that sheep will procure their support many days before cattle can do so. Aside from this consideration, I believe sheep are peculiarly affected by a sudden transition from dry to green fodder. These changes expose them to the attacks of various diseases, particularly diarrhea, which often prove fatal to sheep when feeble from the effects of a severe winter or the debilitating weather of spring. The udder is liable to become swollen and inflamed by an excessive secretion of milk, produced by an exuberance of fodder, while young lambs frequently suffer and die from diseases induced by repletion, or the use of milk vitiated in the bag. Pastures infested with bushes and noxious weeds are greatly improved by sheep ranging upon them in early spring. Sheep greedily devour the sprouts of this vegetation when young and tender, and thus extirpate the plant, but they reject it when it has become old and woody.

I must reiterate the admonition, because it is of the highest moment, to studiously keep sheep from meadows while the ground is bare during the winter and spring, and late in the fall. Sheep delight in short and sweet feed, and will abandon the most luxuriant pasturage for a range upon a naked barren, or amid the crevices of rocks and mountains. They will rarely feed upon a rank and exuberant vegetation, and when this occurs in their pastures they will avoid it, and seek if possible some closely eaten hill side or stony ridge. This fact affords another reason for depasturing their range in early spring, as the grass by this course may be kept short during the entire season.

When a farm comprehends a mixed stock, sheep should have the last run in the rotation of feeding. Flowing water is very desirable in a sheep range, although not indispensable, as in its absence they feed chiefly when the dew is on the grass. Shade is of the utmost importance to the comfort and thriftiness of sheep. They suffer more from extreme heat than from the most intense severity of cold. Trees or a wood retreat should if possible always be provided. In the heat of the day they will gather beneath the shade, but their particular preference is an

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open glade in the forest, beneath the wide spreading limbs of scattering trees, in which the free circulation of air not only promotes coolness, but expels the flies which so injuriously torment sheep.

When deprived of these resorts they collect along the fences, panting and suffering, in pursuit of shade. In many districts of Europe it is esteemed so important to indulge this desire of sheep, that shepherds are required habitually to drive them during the heat of the day, to sheds or some other protection from the sun, in the absence of other shade. During the prevalence of flies and insects, sheep will be seen clustering upon a sandy or dusty spot if they have access to such, with their nostrils near the ground, and by their frequent agitation evincing the presence of some dreaded object. It is believed that their instincts lead them to such places for protection against these assaults. It seems desirable, therefore, that such resorts should be provided in every pasture if they do not exist, by the removal of the sward in spots.

Unless sheep occupy a widely extended range, they should be frequently removed into fresh pastures. If they are long confined to the same ground it becomes foul, and the herbage revolting to their cleanly habits. This course is particularly necessary when any cutaneous or infectious disease exists in the flock. The foot rot, when it has infected large numbers, so contaminates the soil, as to be perceptible by its offensive odor. This fatal disease is thus often extensively propagated. The scab is also diffused, by confining sheep to a limited pasturage. The diseased sheep by rubbing against rocks and trees leave the virulent matter, which is thus communicated to others. Where sheep walks have thus become deeply contaminated by these diseases, it is a safe policy to withdraw sheep entirely from them, until they are purified by the combined agency of rains and frost.

A novel system of sheep husbandry might be introduced most profitably into many districts of this State. Greater advantages would be derived from it, if pursued on a scale so extensive as to authorise the constant services of a shepherd. Extended ranges of mountainous and hilly tracts and barren sand plains exist in various sections of the State, and are now unoccupied and profitless, which are admirably adapted, and should be occupied for sheep walks. Thousands of acres of such lands, highly congenial to the habits of sheep and upon the natural

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herbage of which they feed with avidity, might be profitably devoted to this pursuit. By folding the flock at night with a hurdle fence, or some other expedient used in England in preparing land for the turnip culture, many acres attached to each range might be annually subdued and converted into rich and profitable tillage.

Flocks of sheep are very apt to become scattered in the summer, and are exposed to the depredations of animals and pilferers. They should be counted as often as once each week, that they may be recovered if missing or protected.

Salting.—The regular and habitual supply of salt, both in summer and winter, for sheep is more neglected than any other detail of sheep husbandry, and yet nothing is more essential to their health and comfort, as well as their growth and progress in fattening. They manifest their longing for salt by evidences which the breeder well understands. The supply should be regular, for the reason that they are apt to eat of it too copiously when they receive it only occasionally. They should have constant access to it. In the summer, troughs containing salt should be provided under cover, or protected by a slight fence, at all times accessible to them. It is well to pour tar in the troughs and strew the salt over that. While eating the salt the nose of the sheep will become smeared with the tar, which is considered a protection against the attacks of insects, and is itself healthful and agreeable to the sheep. Hay is generally salted, as the medium of supplying stock with the article during winter, but I think it more judicious to afford them free access to the salt, that they may follow the guidance of their instincts in eating it, when and in the quantities they desire.

Catching Sheep.—This process is constantly required at all seasons, but it is generally executed in a manner highly injurious to the sheep. They are handled roughly, and often literally ran down in an open yard. Much sleight and activity are necessary. An inexperienced hand gazes at and rushes upon the whole flock, but the eye should be fixed alone upon the individual intended to be caught, and not be diverted from it. The sheep should be seized by the hind leg or neck, but never by the wool. The shepherd's crook, although seldom used in this country, is a most convenient implement to the shepherd, and enables him to catch the sheep with little fright or risk of injury. It consists of a bent piece of iron, having a knob at one

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end and a socket at the other, intended to receive a wooden handle of any length preferred. Some degree of skill and practice are required for the successful management of this instrument. An old sheep should be carried in the arms, but a lamb may be borne by its fore legs held gently together.

WINTER MANAGEMENT.

A very great and salutary change has occurred within a few years in the winter treatment and care of sheep. It was the custom formerly to feed them from the stack in the open field, without any shelter, and exposed to all the rigors and vicissitudes of weather incident to a northern climate. Sheep suffer less from the severity of protracted cold than from the effects of wet weather, particularly when succeeded by rigorous frosts. The wool saturated with water, is frozen on the animal, and the sudden transition produces various fatal maladies to which they have extreme susceptibility. No description of stock was once treated with so little care and watchfulness as the tender and sensitive sheep. Now, however, they receive the most vigilant attention, equaling almost among our most experienced wool growers, the care given formerly to the choice flocks of Saxony. The effect of this treatment is manifested by the vast improvement in the condition of sheep, by the economy secured in their wintering, by the improved quality of their wool, and the immense decrease in the ratio of losses in the rearing of lambs. These losses scarcely amount to a fraction among the most skillful and cautious breeders. In Vermont, where it is conceded our sheep husbandry has been brought to the highest perfection, and where probably more intelligence and greater experience guide their management than in any other section of the Union, warm and enclosed sheds have been extensively introduced.

On this subject Judge Pettibone remarks: "Still greater improvement has been introduced in the manner of keeping sheep. Warm and close sheds have done much, I think, to improve the character of the wool and to increase its growth. For nearly fifteen years, you know I have kept my sheep in close sheds or barns. During this time I have generally wintered at a barn nearly one mile from my house about two hundred sheep, including lambs, yearling ewes, wethers and bucks. They have no grain at all, and in that time I have not lost ten and none of these by poverty. I have good warm water conveyed to the barn, to which the sheep have access. They have also salt by them continually. This, with as much hay as they can eat, is the way I keep my sheep, except my breeding ewes."

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The practice of Mr. Purdy, detailed in the letter from which I have already quoted, is very similar. He says, "I divide my sheep into three separate flocks—ewes, lambs and wethers, treating each according to their several necessities, but taking care that all are well housed and have free access to running water, which is conveyed into their sheds. I guard them very carefully from getting wet, as this causes them to itch and pull their wool. When the weather is moderate and the sun warm I allow them to run in the yard, but at nightfall they are shut up. I feed well twice a day from racks under shelter, being careful to observe that all are up and there. As soon as grass starts I turn them out in the middle of the day, but keep an eye on the weather in reference to wet and cold, but never leave them out over night until they are strong and the weather settled. In this way I seldom lose more than two or three lambs to the hundred, nor indeed of old sheep either, and these losses are generally the result more of casualties than of disease."

The modern practice of introducing running water into the sheep-fold, and the enclosures of all stock, is of the highest utility. They drink when the appetite dictates, and without the excess which is often injurious, when they have been long restrained, and they escape the exposure to accidents from falling on the ice and wallowing through deep snows, to which they are liable when driven any distance to water. Sheep should not be compelled to allay their thirst by eating snow. Instead of exposing sheep to the driving storms in open sheds, as has been customary, I have found it very advantageous when they are not housed to enclose the shed in front from the top to about four feet above the ground. This arrangement furnishes a free passage to the sheep the whole length of the building, and at the same time protects them from the cold, rain and wind.

The different classes of sheep should be kept uniformly in separate enclosures; the bucks and wethers, and perhaps dry and hardy ewes together, the breeding ewes and lambs each by themselves. These should be again subdivided if the flock is large, so that no yard shall contain more than one hundred, and indeed it were better to limit the number to fifty. In addition to such enclosures, each fold should embrace one or more apartment devoted to the sick and feeble, which as soon as they are observed should be removed to these hospitals as they are usually designated, for the benefit of extra nursing and feeding. The

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strong and voracious will always overpower and thrust aside the more delicate and weak. Many of the latter are annually lost from neglect in attending to this fact and removing them for better care.

Great judgment is required in the proper and economical feeding of sheep. They are remarkably cleanly and fastidious in their habits, and will not eat fodder which has been trampled upon or become stale. They should be fed abundantly, but no more at a foddering than they will freely consume. If any fodder remains it should be gathered up and fed to other stock. When it is left to accumulate in their feeding place and fresh hay is placed on it, sheep are apt to loathe the whole and feed with less relish. Freedom of locomotion is a passion (if the idea may be applied to animals,) with sheep, and unlike most stock they will not endure close confinement. Their enclosure may be small, but they must be allowed to move about it unrestrained and will not thrive when tied up to a stall. Any close confinement however is unadvisable.

The winter arrangement for feeding sheep is of the highest importance. If practicable they should be fed under shelter. Racks may be used conveniently for forming the separate enclosures. When intended for this purpose, two poles of pine, cedar, or any timber that will readily split of the requisite length and size, should be bored with holes about four inches apart, and an inch in diameter. Let the poles be split, to form the bottom and top of the rack. The rounds, which should be about three feet long, may be made of sawed stuff or poles. The horizontal sticks should be placed on stakes, about eighteen inches from the ground, and form a rack between two and three feet wide. A similar rack, although presenting but one side for feeding and narrower, may be constructed on the inner side of the shed. A very convenient rack, particularly if it is intended to be used in an open yard, may be constructed in the following manner: Nail two narrow boards on three pieces of scantling, about four feet long, one at each end, and the third in the centre of the board; let the lower board be about a foot and a half from the ground, and a space between the two of four or six inches. Form another set in the same way, and unite them by short pieces about two feet long at the ends, with a brace in the middle. This structure enables the sheep to feed on each side and at the extremities, and can be moved with facility whenever required. Although the form may be varied in other particulars, the rack should uniformly be perpendicular, in order to prevent the seed and dirt which

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fall from the hay dropping upon the sheep and becoming mingled with the wool. The rounds or boards should be placed sufficiently near together to prevent the introduction of the head into the rack. If permitted to do this the sheep will only select the choicest portions of the hay, and reject and waste the residue.

Troughs for feeding grain and vegetables may be conveniently constructed by nailing together two narrow boards, or clap-boards, and placing them in an opening sawed into a short piece of thick board in the form of a V, secure them in three of these openings and close the ends. This makes a portable trough, sufficient for every practical purpose. Great care should be taken to have a length of racks, and troughs abundantly sufficient to afford room for the entire flock, otherwise the poor and feeble will be excluded by the more powerful. Sheep eat their fodder with great avidity when spread upon the frozen ground or clean snow, and in moderate weather, if the surface is hard, this mode of feeding is very proper.

The fences enclosing stock yards should be high and tight. This not only protects the stock from cold and storms, but is a great security against fodder being scattered and wasted by the wind.

A great and important advantage of sheep husbandry consists in the circumstance, that sheep consume and thrive upon fodder not adapted for other stock. Coarse grass, and hay infested with brakes, briers and bushes they eat with avidity; indeed it sometimes appears that they prefer the latter to the most delicate of the cultivated grasses. They will often be seen contending for a broad and succulent leaf, while they abandon the choicest hay. They probably delight in this fodder on account of some peculiar stomachic qualities it contains, which is grateful to their taste. It is stated that the Orkney or Shetland sheep at times subsist on the coarse sea weed, and that they are occasionally fed on flesh and dried fish. Sheep readily devour the haulms of beans, and buckwheat and pea straw. In some portions of Europe pea straw is cultivated for the specific use of sheep. Breeding ewes, however, require the most nutritious feed. Two full fodderings daily are sufficient, but I have generally found it advantageous to give a slight feeding at noon.

The fact that sheep, like all other stock, require much more feed in cold than in warm weather, and when exposed unprotected than if housed, should be regarded by every attentive breeder. Unless it is observed, sheep will be exceedingly liable to waste in

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one event and suffer from a want of food in the other. They should be supplied with the fodder they will promptly eat, but never with any excess that they leave. The prosperity of a flock depends very essentially upon regularity in feeding. It is generally estimated that ten sheep will consume one ton of hay during the foddering season. Unless this quantity is very considerably aided by other feed, such as grain, vegetables, straw or browse, I think this estimate, with a flock of an average size, too low. Succulent vegetables are highly promotive of the health and thrift of sheep. A judicious use of browse, when the proper kind can be procured, is economical, and conducive to the health of sheep.

The browse of hard wood is esteemed less favorable than that of evergreens, and some of the former are considered decidedly injurious, particularly when combined with the large and swollen buds of spring. Some of the oaks are too astringent, and the black cherry has, it is believed, a tendency to produce abortion. The hemlock and pines are decidedly best adapted for this use, and among these I have found the pitch pine far preferred to every description of browse by my sheep. They consume it with great voracity. This pine possesses in an eminent degree the basis of turpentine and tar, which sheep eat with great relish and benefit. That this browse contains highly nutritious properties is evident from well authenticated instances of lost sheep having wintered exclusively on this food, and being found in a good condition in the spring.

The flock should be yarded so early in autumn as to prevent their becoming feeble and emaciated by scanty picking on the verge of winter. The proverb familiar to sheep breeders that "a flock fat in the fall is half wintered," embraces much truth with wise admonition.

Before being turned out to fresh grass in the spring, sheep should be carefully tagged, or in other words, the wool about the buttocks and inner sides of the thighs be sheared off. The flux, which usually attends the transition of food, nearly destroys this wool for useful purposes. By this process a very considerable amount, in even a small flock, is preserved, and the animal and shearer are both relieved from much discomfort and inconvenience, and the former often from absolute injury.

Washing.—This operation should be performed thoroughly and with great care. The fleece is too often left but partially cleansed and filled with dirt. This neglect seriously impairs the beauty and value of the wool, and adds to the labor and expense of shear-

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ing. Washing should not take place until the new wool has started, and not then before the weather has become warm and settled, which in our climate seldom occurs earlier than the middle of June. If the common practice is followed, by which men stand in the water while washing, a running rapid stream if possible should be selected, which has a hard bottom. The sheep should be handled with great care and gentleness. When they are first placed in the water, it becomes at once turbid about them from the great amount of filth which the fleeces have accumulated. The animal should be moved about in the water with considerable rapidity, as by this means the wool is thoroughly saturated. The washer should continue to press and rub the fleece until the water becomes clear. The skin as well as the fleece should be freed from all dirt and foreign substances.

If practicable washing should be performed early in the morning, in order that the sheep may become partially dried and warm before night. After being washed, sheep should be kept from dusty avenues, and hence it is well to wash them in a rainy day. They should be confined in a clean pasture, mantled with turf, as they will not fail to seek any spot of sand or burnt fallow, if either is accessible, to relieve themselves by its warmth and dryness from their uncomfortable sensations produced by washing.

A more approved method of washing which has in late years been introduced, is to place a half hogshead or cauldron kettle beneath a spout projecting from a fall of pure water. The sheep is held in the cauldron, while the spout discharges a stream of water upon it. The washer presses and rubs the fleece, opening it along the back to allow a thorough action of the water in the wool and upon the skin. This method is completely efficient and very expeditious, as it is stated two men will wash one hundred sheep in about one half day. The sheep are less liable to be injured, and the operators are exempt from much inconvenience and exposure.

In some sheep growing districts of Europe sheep are habitually sheared unwashed, but the practice has not been extensively adopted with us and cannot I think be approved.

Shearing.—Sheep should be allowed to run after washing a week or ten days before they are sheared. This period is necessary for the fleece to become perfectly dry, to recover its usual weight and to retrieve its natural oil or yolk, which is of the utmost importance to the quality and value of the wool for manufacturing purposes. Shearing is executed with greater

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ease and celerity when the animal is full and round, and hence it is advisable, when the weather is favorable, not to confine a larger number than the gang of shearers can finish in half a day. Various modes are pursued by different shearers in performing this operation, and it is difficult to prescribe any general rule. Skill can alone be attained by practice and experience.

While the competent shearer may generally be left to follow his peculiar mode, the breeder should insist on some general observances—that the fleece be sheared close and even, this is equally important in reference to the weight of the present clip and to the appearance of the succeeding fleece—that the wool be severed from the body by a single movement of the shears and not clipped—that the fleece is left entire and compact and not torn, and that the sheep be not cut or harshly treated. If these rules are observed sheep will be well sheared. They can be executed by skill and care, but much in securing the result will depend on the animal being held in an easy and comfortable position, and thus kept quiet.

The fleece should be spread upon a bench with the exterior upwards, then remove from it all foreign substances, place the loose wool in the center, double over the sides towards the middle, until the fleece is reduced in width from eighteen inches to two feet, depending upon its size; commence at the rump and roll up the fleece, compressing it as closely as possible; turn back a few inches of the neck part and then double it over. This will expose the wool about the shoulders to the surface. Instead of twisting a part of the fleece into a rope to bind it up, it is far more convenient to secure it with twine. This should be passed three or four times around and across the fleece, which will preserve it in a compact and firm condition. Wool should be stored in a place both cool and dry. After a period, if subjected to great heat, it loses its weight and vitality, and in damp situations, it is liable to mold. Wool it is believed will produce spontaneous combustion if accumulated in large masses in a warm apartment.

The custom of shearing early lambs which prevailed soon after the introduction of the Merino, has been I believe, universally abandoned.

As each sheep is sheared, it should be marked with tar or paint, and this is also an appropriate time to smear the nose with tar, in order to protect it from the insects already described.

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Examining and culling.—The occurrence of shearing affords a suitable and convenient occasion for carefully examining and culling the flock. Old and infirm sheep, those deficient in form or inferior in the quality of wool or weight of fleece, and ewes habitually barren, should be turned off for fattening. The hoof, when grown to an unnatural length, which often occurs with Merinos, should be pared off with a chisel or sharp knife. The horns should be sawed off, if their growth has a direction towards the head. A horn not unfrequently penetrates and destroys an eye, and I have known instances of its pressing upon the skull and thus injuring the brain, and of the flesh wounded by the same cause, becoming ulcerated and infested by maggots.

Except under peculiar circumstances, sheep cannot profitably be retained after they are four years old. It is advisable to turn off wethers at three, as they do not essentially improve after that age. Ewes, as I have before remarked, are less reliable as breeders when old. The wool of all sheep, as they become aged, depreciates in weight and fineness. There is a greatly augmented risk and care in wintering sheep after they have passed the age of four years, while they have much less adaptedness to taking on flesh, and produce a smaller amount of tallow than young sheep.

The age of the sheep is readily determined by the teeth. A lamb has eight pointed teeth. At one year old it loses two front teeth and receives others broader and longer. Four broad teeth appear at two years. At three years it has six. After four years it sheds all the lamb's teeth and has eight broad teeth. The teeth from this period begin to break and fall out, and at eight or ten the entire have generally disappeared.

It is evident that sheep cannot profitably be retained after the teeth commence decaying. As the change in sheep does not uniformly take place until after the ordinary period of shearing, it will be advisable to subject the flock in autumn to a second examination.

Unless the weather is remarkably mild, or sheep have access to a thick wood for protection from cold or storms, they should be carefully sheltered several nights succeeding their being sheared.

Smearing and dipping.—The custom has prevailed immemorially in certain districts of England of applying an ointment to sheep immediately after shearing. Mr. Bakewell was a decided advocate of this practice, from the opinion that it relieved the animal from vermin and cutaneous affections, and created a protection against cold and wet. It was also alleged that such ap-

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pliances prevented the wool from acquiring at the exterior when it first starts, a harsh and wiry form, which results, it is supposed, from the natural yolk not being immediately secreted. The following preparation was applied advantageously to the Merinos soon after their introduction, "To about eight gallons of buttermilk and soft water in equal proportions, add half a pint of spirits of turpentine, one quart of strong decoction of tobacco, and one quart of salt. Scrub the sheep thoroughly with this, using a hand brush. After this operation has been performed, smear them over lightly with a soft brush with ointment made as follows: one gallon of tanner's oil, ten pounds of tallow, one pint of tar and a little flower of sulphur. These preparations are sufficient for one hundred sheep."

These applications were doubtless useful, but they were not designed to communicate an artificial weight to the fleece, by the incorporation of substances unnatural to the wool, nor to impart to it a false coloring by the infusion of oil and lampblack.

The modern practice of dipping in a decoction of tobacco is preferable in many respects to smearing, and equally effective in promoting the desired results. About ten pounds of the leaf, or damaged tobacco, will form the preparation for one hundred sheep. Let the tobacco be boiled in a large kettle until its strength is extracted, then pour a portion of the liquid into a half hogshead, and dilute it with water until it is so reduced that it will not be injurious to the sheep or operator. It should be a little more than blood warm. Dip the animal in the solution up to the ears, but be cautious that the liquid does not enter that organ or the eyes. Let the sheep remain a few seconds standing in the tub to drip, and then place it on an inclined plane formed of boards battened, with side pieces, and discharging into the tub. Rub down one side of the sheep, and after turning it over, the other side with the hand, so as to relieve the wool from the redundant tobacco water. The operation is disagreeable, but is rapidly performed. The decoction and water must be added as either is required. This work should be delayed until the sheep have recovered from the wounds inflicted in shearing.

I think this process a complete antidote to the scab, and that it destroys ticks and lice with their knits; that it removes most cutaneous and skin affections, and exerts a general cleansing and healthful influence upon a flock. It should be repeated every second or third year. It is indispensible to the perfect success of this operation, that the lambs should be dipped at the same

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time and with great thoroughness, as the ticks abandon the old sheep after shearing, and seek refuge amid the thick wool of the lambs, and will not be extirpated unless the dipping is extended to the latter.

Fattening sheep.—Sheep take on flesh and fat with great rapidity, when they enjoy a good range of sweet and abundant pasturage. Those that are not nursing, rapidly recover their flesh in the spring and are soon ready for market. They will not endure close confinement in stall feeding, but when fed an extra supply for fattening should be allowed an ample range. In England sheep are chiefly fattened on turnips in the field, although our climate will not permit the adoption of this economical practice, turnips may still be classed among the most valuable ingredients for the fattening of sheep. The ruta baga, pumpions, carrots, and indeed all vegetables are highly useful for this purpose. Beans are peculiarly congenial to sheep, and prepare them rapidly for the shambles. Corn is probably better adapted for them than any other grain. Vegetables should be sliced for their consumption, and a vegetable cutter will be found of great utility and convenience in this preparation of their food.

DISEASES OF SHEEP.

My limits will allow me to notice only a small number of the most common maladies to which sheep are subject. These however will embrace most of the diseases which can be safely treated by the ordinary breeder. Although sheep are peculiarly sensitive to the attacks of disease, and yield unresistingly to its effects, they are remarkably tenacious of life, when exposed by the consequences of flesh wounds or fractures. The treatment of a wound, even of a severe character, is very simple. Let the wool be removed from the vicinity and the wound carefully cleansed, then bring the parts together and secure them by a bandage or sticking plaster. If the laceration is large, a few stitches may be necessary to close the wound. A sharp crooked needle is the most convenient instrument for this purpose, and any adhesive substance may form the plaster. An ointment made of pitch and beeswax in equal parts, combined with double the quantity of mutton tallow, or one of tar and suet, should occasionally be applied. When the injury is slight a covering of tar alone is sufficient, and in summer spirits of turpentine should be spread about the region of the wound to defend it from the access of flies. A common fracture may usually be restored by

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replacing the bones and securing them with splinters. These should not be bound so tightly as to produce a swelling by obstructing the circulation, while the limb should be protected from pressure by interposing between it and the bandage cotton, tow or any soft and flexible substance. A bruise may be relieved by washing it with hot vinegar, containing a little tar, or a decoction of wormwood, repeated several times daily until the soreness is removed.

The Scab.—This loathsome disease commonly results from neglect and want of cleanliness. Bathing the sheep in tobacco juice, as has been already stated, I deem both a cure and preventative. To be effectively and economically applied, the operation should be performed soon after shearing. The ablution of the body will then be more complete, and a great saving effected in the use of the decoction which is largely absorbed when the wool has become long. Sometimes when the disease is unusually virulent, this application may not accomplish an entire cure of the flock; or the affection may be developed late in the season. Its presence will be indicated by the animal constantly rubbing and biting its body, and by particles of wool starting from the fleece. In either of these instances, a common mercurial ointment, or an unguent made of suet and turpentine, or one formed of 1 lb. of lard, ½ oz. of common salt, and ¼ lb. of rosin, may be applied. Either preparation should be rubbed thoroughly into and about the postules, the scab having been previously scraped off with a cob or comb. When a sheep appears severely infected by the scab, after the wool is grown, the tobacco decoction, to which is sometimes added a little spirits of turpentine, or a very slight infusion of corrosive sublimate, made as hot as the animal can bear, may be poured upon the affected parts. When the disease has extended over the body, it is very beneficial to apply this preparation along the entire neck and back of the sheep. This may be done by laying open the wool to the skin along the back and pouring the liquid gently upon it, which will penetrate the fleece and be diffused over the body.

The Rot.—This disorder, although marked in Europe by a great mortality, rarely occurs among our flocks. Contradictory opinions prevail on the question of its being contagious. Sheep are supposed to contract it when feeding in autumn on low and damp grounds which have been overflowed, and are enveloped by miasmatic exhalations. The presence of this disease is indicated by these symptoms: the eyes become dim, the skin assumes a yel-

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lowish tinge, the animal is listless, the blood loses it high color, and inclines to a watery consistence and to coagulate; watery swellings appear, particularly under the chin. I recollect of the occurrence of severe losses from the rot in the early importation of the Ramboullet sheep, which were all characterized by this swelling. When these symptoms are revealed, the individual attacked may be considered incurable. The disease can only be averted from the flock by an immediate removal to a high and dry pasture, and if this is occupied by pine, juniper or other aromatic plants, the change will be attended with still more favorable results. A copious supply of salt is recommended as useful in the incipient stages of this malady. An examination of a sheep that has died of the rot will disclose the presence and taint of the disease throughout the entire system. The heart is flabby and disfigured, a general dropsical affection pervades the whole body, the lungs are oppressed with blood and corroded by tubercles. The liver appears the most affected, and often swollen to nearly double its natural size, exhibits a mass of putrescence, while innumerable animalculæ may be perceived floating in the putrescent bile. Parts of this organ are deeply speckled. These comments on this disorder are chiefly derived from British authors. Although we are now happily exempt from the scourge, I advert to the subject that our breeders may be able to recognize the characteristics of the distemper if it should appear in our flocks. The recollection of its destructive ravages, which I witnessed in my boyhood, is still vividly impressed upon my mind.

An extraordinary circumstance connected with this disease seems to be well established. In the early stages of its course the infected animal singularly thrives and improves in its condition. It is asserted that Bakewell exposed his sheep to the malady for the purpose of promoting early and rapid fattening. Authors of high standing, but on this subject I think of doubtful morality, advise breeders, in order to save the value of the flocks, to turn off to the butcher sheep affected by the incipient rot.

Foot rot.—This is a highly infectious disease, and will if not arrested spread through a whole flock. The viscid matter which exudes from the feet of an infected animal will very soon contaminate the pasture, and communicate the disease by a species of inoculation. When the distemper appears, the first measure should be to separate the healthy from the infected sheep and to remove the flock to a fresh and clean pasture. A trifling lameness is the first indication of the presence of the foot rot.

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A slight redness may be detected at the junction of the hoof with the leg; the foot is somewhat heated and an offensive matter appears when it is pressed. These symptoms, but more aggravated, will be soon exhibited about the horns of the hoof, ulcerations appear between the hoofs, severe lameness ensues, which often compels the sheep to move about upon its knees. The bone is ultimately attacked, becomes mortified and sloughes off. When these evidences manifest the presence of this formidable disease, the flock should be carefully examined and separated. The feet of the tainted sheep should be thoroughly cleansed, all the corrupt matter washed off and every part of the hoof which appears infected be pared away until the matter is fully discharged, that every particle of the infection may be removed. The foot should be dipped in water or lye of ashes in malignant cases, as hot as can be borne without scalding. After this is done, apply to the parts a strong decoction of pulverized blue vitriol, mingled in spirits of turpentine, or wash with oil of vitriol diluted with twice its quantity of water, or mixed in the same proportion with sweet oil. It is also recommended to dip the foot in hot tar. The rot is sometimes cured by the simple but repeated application of turpentine alone, after the feet have been pared and cleansed. A strong solution of lye and quicklime is also successfully used.

This disease appears to be produced by sheep running on soft swampy grounds, and even pastures upon fine sand which yield to the foot are said to be promotive of it. A high and stony range are the surest protection from its attacks. When a flock has once been infected by it, great vigilance should be exerted to prevent its recurrence, and a breeder is guilty of great improvidence, who introduces sheep into a healthy fold from a flock affected by the foot rot.

Diarrhea.—Sheep are very subject to scouring when turned into fresh pastures, but this is not injurious unless it become excessive. It may be cured in ordinary attacks by returning the animal to dry fodder. If this remedy does not succeed, give a small dose of prepared chalk, mixed in spirits with five or six drops of laudanum. This may be repeated every hour or two, and be extended to a tablespoonful of the mixture. Soot tea given in frequent doses of about half a gill is often effective, and a decoction formed by boiling about two ounces of logwood in a pint of water a few minutes, mingled with the chalk mixture given at short intervals in doses of one gill seldom fails of effecting an

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immediate cure. If the attack assumes a dysenteric character, which is indicated by discharges of bloody mucous, a more energetic practice is required. First, thoroughly evacuate the bowels by one or two portions of salts or some vigorous purgative, and then administer repeatedly the above preparation, occasionally using a cathartic, such as the salts, or a mixture of molasses and yeast. Continue these applications until all symptoms of the disease not only abate but cease, as sheep are peculiarly liable to a relapse in these attacks.

Ticks, lice and other vermin may be extirpated by using the bath of tobacco juice in the manner already described. When the bathing cannot be performed, the same treatment prescribed for the scab, in applying ointment and the hot tobacco decoction will be found equally efficacious in these cases. The smoke of tobacco is sometimes injected into the wool by means of a tin pipe communicating with a large bowl containing the leaf.

Worm in the head.—This is often an exceedingly fatal malady, and is produced by a fly which deposits its eggs in the nostril of the sheep. The animal, during the heat of summer, will frequently be noticed almost maddened by the attacks of this insect and making the most agitated efforts to avoid it. I have already referred to the use of tar as a protection against their attacks and believe it to be the only practical antidote. Many writers suggest injections into the nostrils of Scotch snuff, tobacco juice, and even spirits of turpentine, but these remedies inflict great suffering upon the animal and in practice I have never seen any benefits result from them. It is conjectured by some authors, that these worms always exist in this receptacle and are placed there by a provision of nature to preserve the animal from the assaults of more dangerous enemies. The worm proves rarely if ever fatal to sheep in good condition, although it is possible that it may be the origin of the debility and low flesh, which is generally apparent in sheep which die from this cause. Strong and vigorous sheep are often seen to eject worms from the head in sneezing.

Stretches.—This is the popular name of a malady which generally attacks vigorous sheep in high health. It is produced by an obstruction of the intestines, and is caused by one portion of the bowels becoming introduced into another part. The suffering is extreme, and is manifested by spasmodic contortions of the sheep, its lying down, stretching and rolling upon the ground. Death speedily follows, unless relief is promptly afforded. In connection with the use of powerful cathartics, the most success-

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ful practice I have known is to raise the animal entirely from the ground by the hind legs, and hold it in that position a few seconds. Let the operations be repeated several times, with short intervals. I have seen sheep, which were suffering the keenest agonies, released immediately by this process. The disease is probably induced by the exclusive use of dry fodder, and may be averted by changing to vegetable food.

The sheep pox, or claveau.—This noisome and fatal distemper, which seems identical in its character with the small pox, like several other diseases, was introduced with the early importations of the Merino. I am not aware of any recent occurrence of it among our flocks. It appears in postules or tumors about the face and neck of the sheep, which contain foul and offensive matters, and resisting all treatment, spreads throughout the system. It is recommended to instantly remove the infected individuals and to inoculate the whole flock. To perform this process take a little of the matter from the tumor upon a knife and introduce it, by making a small puncture through the skin. No other remedy is availing.

Poison.—Sheep are frequently poisoned by eating various plants, particularly the laurel, poison ivy and sheep laurel or kalmia latifolia. The symptoms indicative of poison are frothing at the mouth and a swelling of the abdomen. Melted lard or suet, poured down in small doses, which should be repeated at intervals of fifteen or twenty minutes, will generally effect a cure.

THE ALPACA.

When Peru was discovered by the Spaniards they found the immeasurable wealth in silver and gold of the Incas, less an element of their prosperity and civilization, than was the possession of the extraordinary animals they held in domestication. The invaders beheld with astonishment innumerable droves of animals endowed with many of the valuable qualities of the camel, and countless herds of wooled animals, whose habits and qualities recalled to their minds the flocks of their native land, and which they hailed by acclamation as the sheep of Peru. These animals were different members of the family of Llamas. The term Llama is specifically applied to the variety used by the Peruvians as beasts of burden. Llama seems to be the generic name for several

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species of Peruvian animals, of which the Alpaca is far the most valuable for its wool when domesticated, and it is remarkable that in modern times so important an animal has received so little attention.

The Alpaca unites in its qualities and habits a singular analogy to several other animals, and yet in itself is eminently distinct and peculiar. From their wool the Peruvians formed the beautiful fabrics which excited in Pizarro and his followers so much surprise and admiration. These fabrics were remarkable for their richness, their lustrous appearance, and for the brilliant coloring they received. The formation of the Alpaca wool is very striking. "Each filament appears a straight and polished tube, possessing a brilliant transparency." It grows to great length, and is very strong, that at this day transported averaging from ten to twelve inches in length. It has no yolk, and yet the fibers are pliable and not dry. There is no under hair, and the wool is peculiar for its evenness.

It would seem to be distinguished for its great durability, as it has been discovered, in comparatively a modern period, undecomposed in the burial places of the ancient Peruvians. The ordinary weight of the fleece of the Alpaca is said to be about ten pounds, although it is alleged that individuals of the species are now cultivated in England which will yield fleeces of thirty pounds weight.

The feet of the Llama genus are all cleft, and pointed with sharp claws. This peculiarity confers upon them, even more than the Goat, sure-footedness, and the ability to feed amid cliffs and precipices.

In their flesh and skin the Alpacas have great analogy to the Deer. The former is an essential article among the Peruvians of sustenance, and jerked is used for the same purposes as bacon in Europe.

Spanish writers remark that the Alpaca is not appropriated for its milk. In their wool-producing properties they exceedingly resemble the Sheep. The structure of the stomach of all the Llama tribe has great similarity to that of the Camel; they possess the same power of endurance in the absence of food and water; have the same capacity for the retention of fluids, and of returning water while ruminating to the stomach and throat, and they live, like the Camel, on the coarsest browse. The Alpaca have a cleft upper lip, and long and slender necks, which enable them to reach and feed upon mosses and lichens growing upon rocks and

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precipices. The formation of their teeth and lips allow them to eat harsh and prickly shrubs, which repel all other animals except the Llama and Camel.

The Alpaca ewes are in heat in the latter part of summer, and, according to Molina, their period of gestation is between five and six months. One young is produced at a birth.

The same author considers the Vicana, which is one of the species of the Llama, and is hunted for its wool and skin, the Alpaca in its undomesticated condition. The Alpaca delights in lofty and barren mountain ranges. They inhabit the Andes at an elevation of from 8,000 to 10,000 feet, and live, with no supply of food from man, by browsing the scanty herbage bushes and lichens along the line of eternal snow.

Unlike the sheep, they appear to have an attachment to localities, never wandering from their own districts, and are so gregarious that one flock does not mingle with another.

There is little doubt, but that unskillful treatment in breeding has much deteriorated the quality of the Alpaca wool since the discovery of Peru. The defective system of the Indians, by whom these animals seem to be almost exclusively cultivated, have immensely decreased their number. It is estimated that the whole capacity of Peru and Chili is unable to produce for the requirements of foreign commerce, under the present system, more than two millions pounds of Alpaca wool, while the demand is almost unlimited.

This wool is valuable for combing, and the manufacture of worsted goods, but is not adapted to fabrics requiring felting. The present market price is, I believe, between fifty and sixty cents.

No animal is more hardy, or better calculated by nature to bear the rigors of the harshest climate. Its heavy coating of wool, aided by thick integuments of fat along the back and loins, rendering it almost impervious to the cold, while the long, smooth, and glossy fibers of its fleece shed the rain and snow.

In addition to all these qualities, nature has supplied the Alpaca with a soft and thick substance over its breast, upon which it rests when reposing, and which is designed to shield it from injury amid its native rocks.

The Alpaca has been translated into various countries, and has readily adapted itself to the changes. It has been found to prosper among the mountains of Spain, in Germany, in England, and upon the Highlands of Scotland, where it seems peculiarly to re-

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joice in the harsh wild hether and other coarse herbage indigenous to that region.

I have gathered these facts from various authors, which I have been able to consult, (and am chiefly indebted to Morton's Cyclopedia,) with the view of presenting this subject to the American agriculturists. Almost every section of our country embraces districts worthless for all other purposes, which might be most profitably devoted to ranges for the Alpaca. The summits of our loftiest mountains east of the Mississippi are not so elevated as the primitive home of the Alpaca upon the Cordilleras. Formerly the exportation of the Alpaca was much embarrassed by the confinement incident to a long passage of several months around Cape Horn, in which large numbers have perished; but now they can, with great facility, be carried by a short voyage to Panama, thence driven or transported by railroad across the Isthmus, and be shipped at an Atlantic port.

I have no knowledge of any Alpacas having been introduced into this country; but I deem the subject of their importation of sufficient magnitude to demand national consideration. The sheep sometimes called Alpaca should be confounded in no respect with the Peruvian Alpacas.

THE GOAT.

Although this animal in many countries occupies a position in value and utility hardly secondary to that held by sheep with us, it is scarcely embraced among the domestic animals of the farm. Within a few years the subject of their cultivation has received considerable attention, in reference particularly however to the introduction of the Cashmere goat, and crossing them with the common Goat. In many of its habits and qualities the Goat seems to be allied to the Sheep by striking affinities and analogies, and indeed many naturalists are almost inclined to recognize the animals as varieties of the same species. Under changes of circumstances which modify their peculiarities, the Goat becomes essentially woolly, while the wool of the sheep is converted into a covering singularly assimilated to the hair of the goat. In England and Scotland Goats are much less numerous at present than they were centuries ago, although the numbers of every other domestic animal have immensely increased. Goats were brought into New England in connection with the earliest im-

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portations of Neat cattle. Among the mountains of Wales they still exist in great numbers, and I can perceive no reason why they may not be profitably reared in similar districts of our own country. They are more hardy than sheep, less liable to disease, they prosper on even coarser and cheaper food, they are more prolific, they may be shorn for the fleeces and in addition are valuable for the milk they yield.

The meat of the Goat, especially of the Kid was highly esteemed in the patriarchal age and in many countries is still held in great repute. In Males the haunches of the Goat are salted and dried and form a valuable substitute for bacon. The flesh of the spayed or castrated Goat is known as rock venison, and is equal it is said, in fatness, delicacy and flavor to the meat of the deer. The Kid is not inferior to the Lamb as an article of food. In Spain and Portugal, Goat's meat is exposed in the shambles equally with the flesh of other domestic animals, and is in as much request. The suet of the Goat is superior in whiteness and utility to the tallow of sheep or Neat cattle, and will command where it has been used, a higher price in market. It was and may still be customary in some districts of Wales, to allow Goats to run wild, until they are four or five years old, and then to hunt them chiefly for their fat. The skin of the Goat is highly valuable for manufacturing purposes. The hide of the Kid is peculiarly adapted for dressing into a fine fabric from which the choicest gloves are made, and the skin of the matured Goat is manufactured into leather of the finest and most delicate quality. The hair of the Goat is indestructible in water and possesses therefore immense value as a material for the fabrication of ropes and cables. It is also manufactured into numerous articles of clothing and for domestic uses. The hair of the white Goat was in great demand for the manufacturing of bushy white wigs, when that article of costume was dictated by fashion.

The milk of the Goat is nutritious and sweet, and is esteemed to be highly medicinal. Invalids still repair to the mountains of Wales to drink it. Cheese and butter may both be made of Goat's milk, but they are said to be affected by a peculiar, although not unpleasant, flavor. When mixed with an equal proportion of cow's milk, it produces cheese of a most excellent quality and greater in quantity than that yielded by cow's milk alone.

These views present, I believe, the distinguishing qualities of the animal, and form the inducements for breeding Goats, as they have been formed by my limited personal observations and

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as I have derived them from the authors I have been able to consult.

The idea of making the common Goat the medium of diffusing the breed of the Cashmerean Goat in this country, presents the subject in a novel and deeply interesting and important light. This consideration seems to justify a rapid glance at the habits and qualities of these animals, that they may be familiarized to our farmers, if circumstances should lead to their more extensive propagation.

The Goat is naturally docile, and susceptible of domestication. They delight in the rock and cliff; they will fatten on moss and browse, and will easily sustain themselves if driven to the necessity on the coarsest forage, and even upon the bark of trees. Great difference exists, it is stated, among the same family of Goats in their capacity for yielding milk. The black, or those approaching that tint, are reputed to be the best.

The female is in season from the 1st of September to December, and her period of pregnancy is about ten weeks. She usually produces two kids at a birth, but often three and occasionally four. Goats will couple when a few months old, but should be restrained until they have reached a mature age, which is from eighteen months to two years. The male possesses extraordinary virile powers, and in the rutting season impregnates the whole surrounding atmosphere with his fœted odor. Although disagreeable to the nerves, this odor is believed to be highly salubrious to man and brute. Goats are frequently kept in stables under the conviction that their smell promotes the health of horses. My Irish laborers often importune me to introduce a few Goats into my sheepfold, with the assurance that the influence of their odor and breath would secure to the sheep exemption from ordinary diseases. I have not noticed the idea adverted to by any writer, but am assured by these men that such is the practice in Ireland. The first kid, it is advised, should be allowed to run with the mother, as it is believed its constant action upon the udder tends to expand and invigorate it, and thus improves her subsequent capacity for secreting milk. The kid is fit for slaughtering when a few days old. The Goat continues to bear until she is about seven years of age. The male is seldom used for breeding after he is five.

The Goat should be milked three times each day at equal intervals. A good milker yields, the first three months after yeaning, about a quart at each milking, after that period she gradually

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decreases, as she approaches another parturition. She may be milked until within a few weeks of that time. The goat possesses the peculiar habit of ceasing to feed and to secrete milk after her udder is filled. She lies down and remains quiet until relieved of her burthen, when she again resumes her feeding, and the secretion of milk recommences. Hence the necessity of these frequent milkings.

It is alleged that Goats yield more milk and thrive better when confined. For this purpose, when the number is small, they may be tethered to a post or pin by a cord, and removed as circumstances require. They are very prone to be mischievous, and should be hoppled and yoked, or secured by an implement which is appropriated to them in Wales, and called a "puzzle." It is constructed of three sticks placed in a triangular form, and fastened about the neck. Goats, however, if propagated in any quantity, should be kept in the charge of a goatherd, as sheep should always be in the custody of a shepherd.

Several varieties of the goat family possess extraordinary value on account of the fine wool or curly hair they produce. Among the most valuable and conspicuous of these varieties are the Angora or Goat of Cashmere, and the large Goat of Thibet. These animals yield the raw material from which is fabricated the shawls of commerce, which often command from $1,500 to $2,000. It seems to be determined by recent experiments that these Goats may be successfully crossed with the common Goat of the country. This fact being established, it is evident that judicious and skillful breeding of a few years may form breeds so near the perfect Cashmere and Thibet goat, that they will be separated by an almost inconceivable fraction, and with no perceptible difference in the quality of the wool. The fifth, or at farthest the sixth cross, with proper management, will leave so slight an infusion of the blood of the common Goat, that the amount could scarcely be calculated. Some districts of our widely extended territory must afford a climate congenial to the habits of these animals. The blood of the common Goat will impart hardihood of constitution to the cross, and aid in forming its acclimation.

Upon their native mountains the Cashmere Goat furnish to the population butter and cheese, flesh and the material for fabricating their clothing. More valuable, for supplying the ordinary wants of man, than the common Goat, the Goats of Cashmere and Thibet are almost priceless in their value, as affording the fabric for manufacturing the articles of fashion and luxury which bear these

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exorbitant prices. Not only the shawls referred to, but the delicate and beautiful camlets are produced from the wool of these animals.

The Cashmere Goat is a very beautiful creature, finely and gracefully formed, with his long silky or woolly covering almost trailing upon the ground. Such were the features of a Cashmere as I recollect them, which a few years ago excited my admiration in the grounds of the Chelsea Hospital, Massachusetts. It is stated that the Cashmere Goat yields a fleece of hair or curly wool weighing from four to eight lbs. The Thibet Goat bears beneath his coating of coarse hair a fine and delicate fleece of white wool, which, when combed, yields about one pound to the animal.

"The Cashmere Goat is hardy and prolific, breeding at the age of one year, with a period of gestation of about five months, and yielding almost invariably twins after the first birth. The fleece is valued at $6 or $8 in France, or Paisley, in Scotland, for the manufacture of high priced shawls. The fleeces, when the animals become numerous, can be produced at less cost than common sheep's wool, and possess durability far superior to it, not only for fine fabrics, but for all the coarse goods. There is also a permanent retention of colors in fabrics made from the hair of these animals."

An examination made by Dr. Chilton and others of the wool of these goats, and wool from the Cashmere shawl, under the microscope, established in their minds a conviction of the absolute identity in properties of the two materials.

Some valuable Goats were imported into this country by Dr. J. B. Davis, of South Carolina, in the year 1849, from the northern slope of the Himalaya Mountains. They were exhibited at the New-York State Fair in 1854, and attracted much attention. A buck and doe were purchased by gentlemen of this State, and have borne our winters favorably. The fleeces of these Goats were exhibited at the fair of the American Institute, and elicited the report from which I have made the following extract. The committee further remark, "The fleeces submitted are identical in character and fully equal in value to the materials from which the highly prized Cashmere shawls are made."

They were supposed by many to be that variety just referred to, and described in works on natural history under the names of Cashmere, Angora, Thibet or Shawl Goat; but it is now believed, from the best information, which can be obtained, that it is a different and more valuable variety.

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The Syrian goat, supposed by a writer in the Patent Office Reports to be nearly identical with the goat of Scinde, is very large in his proportion, and has long pendulous ears. These animals afford a much greater yield of milk than the common goat. In a large portion of the countries of Asia Minor these goats are almost the exclusive dependence of the people for their supply of milk. In that region cow's milk is considered promotive of bilious fevers, while the milk of Goats is deemed medicinal and a preventive of these attacks. Although richer and more nutritious, it is more digestible than the former. This variety may be crossed with the common Goat with equal facility and success as the Goat of Cashmere or Thibet. The common Goat should be sheared annually, about the period of sheep shearing. Preliminary washing does not appear to be necessary. Calmet states that the hair of the Cashmere goat, in his age, was not sheared, but was combed off with great care and nicety.

The Goat is a bold and daring animal, and will fearlessly oppose and generally repels the attacks of dogs and wolves. Their exceeding hardihood enables them to endure the winters of a rigorous climate without requiring that great and vigilant care so indispensable to the safety of sheep. The goatherd upon the mountains of Wales and Switzerland, only folds his flock for the purpose of milking, except in the most severe weather, and then feeds them on coarse and scanty fodder.

I have thus attempted briefly to exhibit the reasons for a more extended breeding of the Goat in its different varieties, and cannot resist the conviction that the subject is worthy of the most careful consideration; and that these animals, especially those which produce the more valuable material, promise to become an important department in our stock husbandry. However the republican economist may deprecate the prevalence of habits and fashion that demands these luxurious articles of costume, while they do exist it is wise, and the dictate of patriotism, to make them subservient to the industry and prosperity of our own citizens.

Our territory embraces soil and climate eminently adapted for the culture of the vine and mulberry. When in the exercise of our own skill and intelligence, America shall produce Cashmerean fabrics, wines, and silk, we shall be liberated from a foreign dependence that wrests annually millions from the country, while new and deep fountains of business and wealth will be revealed to ourselves.

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RABBITS.

A few years ago I should have doubted the propriety of incorporating in a practical Treatise on Husbandry a notice of this delightful little animal. Although in Europe the Rabbit warren has long been a source of great profit to the husbandman, with us the Rabbit has been only an object of fancy and amusement. Now, however, their culture has become so extensive that it would be improper to omit a brief account of their breeding, management and uses.

Rabbits may be made profitable by their fur and flesh, and their dung is said to be nearly equal to guano in its fertilizing properties. Numerous varieties of the Rabbit occur in domestication. Among these most extensively bred the Silver-haired are the most highly esteemed, from the superior value of their fur, and the large size of their bodies. The Lopped-eared are exceedingly beautiful and very large, weighing from twelve to twenty pounds. These are preferrred from their singular appearance and rare beauty, for fancy and amusement, and will ultimately prove the most profitable for their flesh.

The Rabbit is remarkable for very extraordinary fecundity. They commence breeding when about six months old. Their period of gestation is thirty days, and they produce from four to to twelve at each litter. The female will receive the buck soon after parturition, and in the course of nature is capable of producing nearly twelve litters in a single year. In a state of confinement, however, where they may be controled, they should not be permitted to produce more than two litters in three months. If they herd promiscuously, this, of course, cannot be regulated. In selecting Rabbits for breeding, regard should be had to their form, size and beauty.

The male has a propensity to destroy the young, and, as far as possible, they should be separated from him. If Rabbits are kept in hutches the young can easily be protected, but when they run in warrens the instincts of the mother is their chief protection. She covers the nest that contains the young with sticks and earth which she compresses with her body so firmly and with such skill that it is difficult to detect their covert. She only suckles them early in the morning and at night, and for eight or ten days retains the covering over the nest. From this period she begins to leave a small orifice, which is gradually enlarged until they have attained about three weeks, when

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it is entirely exposed; the young at that age being usually able to protect themselves and to commence feeding. It is recommended by writers on the subject, to allow the young to suck about five weeks, if the buck and doe can be kept apart. After the doe has littered, she should be supplied with nutritious food; bread and milk and some succulent material are preferable.

One buck is sufficient for coupling ten or twelve does. Much caution is required in the feeding and management of Rabbits, as they are peculiarly sensitive to the effects of their food. Cabbage leaves, clover, lucern, and almost every kind of green substance, are congenial to them, but it is essential to combine with this fodder dry food, as hay, grain or bran, otherwise the Rabbit will soon become diseased, and no other animal is more certainly and immediately affected by contagion or infection. In winter they may be kept on hay or oats.

When their fodder is green or succulent they should not be supplied with drink, but they require pure and fresh water when they eat dry feed. A writer remarks, that "the common hemlock is poisonous and fatal to the Rabbit." Almost every plant and vegetable when fresh is eaten by them voraciously. Carrots, celery tops and thistles, are favorite articles of food with them. These materials when fed should be perfectly freed from water, and it is affirmed that even the dew which gathers upon the green leaves is injurious. Moisture is considered promotive of dropsical affections with the Rabbit; a disease to which they are particularly subject. An English writer observes, "on this account the very best food that can be given the Rabbit, is the shortest and sweetest hay that can be got, of which one common load will serve two hundred couples a year," and he adds, to attest their prolific powers, "and of this stock two hundred may be eaten in the family, two hundred sold to the markets and a sufficient number kept in case of accident."

The dropsy and the rot, or scab, are the most formidable diseases which attack them, and are both produced by the same causes—eating moist food and a want of cleanliness and pure air. The dropsy is indicated by the swelling of the abdomen, and is soon fatal if not arrested. The scab is first exhibited by a a hardening of the skin, and the fur speedily becoming deranged and matted. These appearances are immediately succeeded by a running sore which rapidly spreads. The ravages of this disease are very speedy and fatal. I have known the entire contents of a warren swept off by it in a few days. The com-

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mon Rabbit of our woods, when caught and confined, become very soon affected by the scab and destroyed. The same remedies may be applied to both these diseases, they are simply a change of food, perfect cleanliness, pure air, and, if possible, a change of location. A proper caution in reference to diet, cleanliness and air will uniformly prevent the prevalence of these diseases. Ophthalmia occasionally attacks the young, and is caused by foulness of the hutches or warren, and impure air. Adopt for relief the same course as is recommended to correct the other distempers. The eyes may also be washed once or twice a day in a solution of three grains of sulphate of zinc in an ounce of rain water.

The fur of the Rabbit is valuable, and in ready demand for the manufacture of hats. In Europe their flesh is esteemed a great delicacy. Sucklings of a few weeks old are generally preferred for the table.

The construction of a Rabbit warren is very simple; the foundation of the enclosure should be laid in brick or stone (although I have seen boards used for the purpose) a foot or two below the surface. This may be surmounted by a light structure of boards or slats. A wire fence might be more secure, as Rabbits will often gnaw through boards. They also require holes, or some other retreat, to which they may resort for protection and breeding.

The following extract contains a sufficient description of the huts or hutches, in other words, boxes, used in the keeping and breeding of Rabbits:

"The breeding hutch, as being the habitation of the doe, is always the larger and contains a double apartment—one for the nest, and the other for the feeding room of the young, when old enough to come into it. The best size is about four feet long by two and a half feet wide; and eighteen inches to two feet high; but they are often made smaller, and those not meant for breeding, are seldom more than two-thirds that size. They are latticed with wire in the front of each, as, if made of lath, the Rabbits would gnaw them; but the division parted off for the reception of the breeding nest, is closed both at the front and sides, leaving only a small door in the interior for the entrance of the doe; indeed an inner division with a sliding door is used for confining the Rabbits while the outer part is cleaned. There should also be a marble feeding trough, which should be regularly taken away after every meal; for Rabbits,

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like Horses, if allowed to cloy upon their food will not afterwards eat it, unless pressed by serious hunger. The troughs should be made of tin or iron, to allow of their being easily cleaned; and should have separate compartments, of not more than four inches long, both for different sorts of food, as well as to prevent the Rabbits from getting their feet into the trough and throwing out their corn. Some persons even add a small rack at one end of the hutch, for the purpose of containing the hay on which they feed; but the small quantity usually given, is more commonly left on the floor. The trough should be either inserted as a drawer, or if placed outside the hutch should be covered by a hinged flap to shut and open, in either the front or one end. The floor is commonly pierced with holes to allow the escape of the urine; but, as the greatest attention is necessary to be observed in the cleansing, it is a good plan to have a false bottom, which may be drawn out like that of a bird cage, for the removal of the excrement, and ought to be every morning scraped and strewed with a little sand, or, in cold weather, covered slightly with refuse hay, for Rabbits will never thrive unless kept dry and clean."—[*Cultivator.*]

I conjecture, however, that hutches will be found impracticable for extensive breeding.

Mr. Burnham, in the Country Gentleman, advises an arrangement which I think both convenient and useful: "In one end," he remarks, "of my Rabbit house, I have a portion divided off from the main hutches, or breeding room, into two apartments for the young Rabbits, after being taken from the does. From these two apartments are openings from the rabbitry upon a clover lawn, where, for an hour or two each pleasant day the young ones are permitted to sport and indulge in exercise."

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HORTICULTURAL REPORT, 1855.

The experiment of holding a State Fair in the southern tier of counties of the State, has been tried. Its success has more than equaled the expectations of its advocates, and proved highly satisfactory to the officers of the Society.

Though feeling much interested in the general success of the fair, we, from inclination, as well as to discharge a particular duty assigned to us, became more particularly interested in the floral and fruit department of the exhibition. The managers of the Society have heretofore assigned the superintendence and the arrangements of Floral Hall to persons eminent for their artistic attainments, great experience and renowned success in designing and decorating this department. Under such circumstances, as we did not like to adopt any former plans, however satisfactory they may have been; and as the fair was to be held away from any city, we could not depend upon the aid and material so abundant in large towns, to assist in decorating, and to add to the general display, and more, as the fair was to be held two weeks later than any previous year except one, which advanced season rendered it so much more difficult to obtain flowers, &c., we almost shrunk from the undertaking, and distrusted our ability to plan and decorate the hall so as to compare favorably with previous efforts, and to meet what we knew to be the almost extravagant desire of its managers, to retain the advanced position of the Society compared with other exhibitions in the Union. We desired some plan that we had never met with. One that would accommodate and control a large crowd, and place every article on exhibition in a position to be examined by every visitor, and at the same time to be secure from injury or depredation, and the whole contribution and decorations to present a scene that could be called, as it should be in reality, the ornamental part of the whole exhibition.

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We made our plan and submitted it to the Executive board, which was approved.

After making provisions for shelves and tables to accommodate exhibitors, we desired an ornament that would in all its parts fill a tent 80 by 130 feet, that its general features could be seen at a single view, and that view be rendered as grand and imposing as possible. In the decorations, we used nothing but native Arborvita and Teucrium, not a single flower being used. As the fair was held so late in the season we dare not depend upon flowers.

Most of the festooning had to be done on scaffold and ladders, consequently it was not convenient for the ladies to assist, and as we wished to avail ourselves of their aid and skill in some shape, the third day previous to opening the exhibition, we published a request that sixty ladies would meet at the hall, and draw, each, one of the counties of the State, and furnish a design appropriately representing the county thus drawn, and that places would be assigned to each on the outer circle of tables.

The ladies responded to the request and to the designs furnished by them, the public are indebted for some of the most interesting and pleasing features of the exhibition.

The whole tent was floored with boards, planed and matched, and so divided by tables, that visitors entered and continued in the same direction twice around the whole hall, first left and then right, and passed out at another door.

The distance from the entrance to the egress was thirty rods, every step of which visitors passed new objects, and every article on exhibition must be passed by every visitor, as every person who entered the hall must pass entirely through before it could be left. The entrance being smaller than at any place through the circles or avenues of the hall, if the crowd was detained at all, it must occur at the entrance.

Exhibitors were satisfied with any place assigned, for one was conspicuous as another.

To give an idea of the arrangements and appearance when ready for the public, we give the following from the daily papers at Elmira:

Floral Hall.—This beautiful hall stands near the center of the fair grounds. It is oblong in shape, being supported by three large center poles, and in size is 80 by 130 feet. The entrance and egress are at the west end. There are two sets of shelves, three tiers in height, running around the hall, con-

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forming in shape to that of the tent. The length of this continual tier of shelves is 1106 feet. The entrance is to the inner circle, passing round from which, left to right, the spectator glides through an avenue to the outer circle, and round that to the egress. By this arrangement all confusion is avoided. In the center is an oval platform, three and a half feet high, on which is placed a map of the State, wrought of evergreens and flowers, with a full length statue of Flora, standing on the center of the map. The margin of this platform on the right and left of Flora, is four feet wide, and in front and rear some ten or twelve, which is covered with flowers, arranged in the most tasteful manner, so that Flora is entirely surrounded by flowers, and a canopy is suspended directly over her head. Over this platform is a canopy wreath, thirty feet in length, in triangular figures, wrought of evergreen, and from which twelve evergreen festoons, suspended over the inner and outer circles by twelve standards in evergreen, reach to the canvass. There is also a festoon running from standard to standard, round the whole circle. The total length of festoons is 1600 feet. Opposite the entrance, at the east, is a raised platform for the band, and on which the "lions" can be seen. A ladies' pavilion is connected with the east end of the hall. Between the standards are places set apart for floral designs for the different counties of the State.

Floral Hall is indeed the great central attraction of the fair, and we say it without fear of contradiction, will eclipse all former efforts of the kind, and leave them in the shade. The designs representing the sixty counties of the State, are most of them admirably executed, and will form a feature of surpassing richness and beauty. Two of them have been conceived and executed in a vein of merriment, which cannot fail to find response from almost every beholder. One of these represents Schuyler county, and consists of two sets of county buildings, in caricature of the great contention concerning the location of the real buildings in that county; while several little "humans" are represented as pulling the ropes, which are attached to three cards on the adjoining county of Chemung, labeled Dix, Cayuta and Catherine—the towns taken by the Schuyler county bill from Chemung. Wyoming county is represented by a large and most ludicrous looking serpent, in the act of swallowing a goose.

We must add one more quotation to this report from a manuscript furnished us:

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"N. Y. STATE AGRICULTURAL SOCIETY,
Executive meeting, October 5, 1855.

"On motion of Mr. Johnson.

"*Resolved*, That to Col. E. C. Frost, of Catharine, Superintendent of Floral Hall, the Society, as well as the citizens of the State, are greatly indebted for the admirable arrangements of Floral Hall, and for its tasteful decorations, superior, it is believed, to any former display of the Society.

(A copy.) "B. P. JOHNSON, *Cor'g Sec'y.*"

In relation to the fruit on exhibition we must be permitted to say, that having attended nearly all the previous fairs of this Society, and we believe the best exhibition ever held by any Horticultural Society in the Union, and we unhesitatingly pronounce this the best display of Apples, Pears and Grapes we have ever seen, and as a whole, the best display of fruits.

The best collection of apples in the State were on exhibition, and no State is in advance of this, and no locality can furnish larger collections of pears than Boston, and their best collection was exhibited by Mr. Hovey.

There were very few peaches raised in the State this season, as the peach crop was a total failure, hence none were expected.

It affords us much pleasure to place on record the fact that a large number of the most eminent horticulturists of the Union were in attendance.—Dr. Brinkle, of Philadelphia; L. E. Berman, of Plainfield, New Jersey; Mr. Hovey, of Boston; Doctor Beadle, of St. Catharines, Canada West; Mr. Barry and others, of Rochester; Mr. Hogg, of New-York; Mr. Prince of Flushing; Mr. Saul, of Newburgh; Mr. Faighnstock and others, of Syracuse, were among the most noted horticulturists who were in attendance, and participated in the discussions at the meetings of Nurserymen and Fruitgrowers, and most of whom attended the floral ball.

Floral Ball.—On Friday evening, at the close of the fair, a grand floral ball was held at Floral Hall on the fair ground.

The tables were all taken out except the platform in the center, which served for the orchestra. The canopy and the festoons running from it to the outer wall were kept in. The canopy was encircled by a continuous row of tapers, and several rows passed through the center, and the tent poles on each end supported a row twelve feet square. The orchestra being in the center, seats occupied the entire circle of the hall.

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The ball proved most successful, and every attendant appeared highly delighted.

To Mr. A. F. Chatfield, my assistant, I tender my most sincere thanks for his ready and valuable assistance during the fair.

E. C. FROST, *Superindendent of Floral Hall.*

[ASSEMBLY

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AGRICULTURAL ROOMS,
Albany, April 2, 1856.

HON. ORVILLE ROBINSON,
Speaker of the Assembly:

I herewith present a supplemental report of the New-York State Agricultural Society, being the report on Insects infesting Fruit and Forest Trees, Field Crops, Pastures and Meadows, made by Asa Fitch, M. D., the Entomologist employed by the Society in pursuance of the appropriation made by the Legislature at its last annual session, for an examination and description of the insects of the State, particularly such as are injurious to vegetation.

This report was not in readiness at the time the annual report was presented, and it is desired that it be printed in connection with that report, of which it is designed as a part.

I am, very respectfully, yours,

B. P. JOHNSON
Corresponding Secretary.

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REPORT

ON THE

NOXIOUS, BENEFICIAL AND OTHER INSECTS,

OF THE

STATE OF NEW-YORK.

By Asa Fitch, M. D.

Executive Committee of the New-York State Agricultural Society:

I herewith present a second Report on the Noxious and other Insects of the State, continuing the account of those species which are injurious to fruit and forest trees, and commencing those which are injurious to field crops. The Report heretofore presented has been so favorably received, and has made the plan and character of the work in which I am occupied so generally known, that no explanations upon this subject are required. Nor is it necessary that I should say a word upon the importance of this Survey of the Economical Entomology of our State, our citizens being universally aware of its value, and of the benefits which will result to agriculturists, orchardists, and others from being informed how they may manage their crops, treat their fruit trees, &c., to shield them from the depredations of insects. Yet but a small part of the injury which we are sustaining from this class of creatures is at present known. Many of them are so minute, so seemingly insignificant and powerless, and conduct their operations where they are so concealed from view, that the damage which they occasion is currently imputed to other causes, and the real culprit is never suspected. Thus, it is commonly supposed that the reason why we now fail to raise such crops of wheat as our lands produced when they were

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newly cleared, is because the soil has become exhausted, the temperature of the winters has changed, &c. But my researches the present season have impressed me with the belief that the insect depredators upon this grain, which have found their way into all parts of our country where wheat has long been cultivated, are the sole cause of the present meagerness and uncertainty of this crop. Having been looking at the wheat midge and the Hessian fly only, in former years, other insects living at the expense of this grain had escaped my notice; and now, on turning my attention again in this direction, I have been astonished to find our growing wheat preyed upon by multitudes of different species of *Chlorops*, *Oscinis*, and *Thrips*, insects which in Europe have long been known as most inimical to the wheat crops there, but which have never hitherto been noticed on this side of the Atlantic. From the time that the blade shoots from the ground until the ripened grain is carried into the barn, it appears at every stage of its growth to be exposed to the attacks of one and another of these vermin. And with such a host of these enemies to withstand, our chief wonder is that this crop is not utterly devastated every year. Could it be released from them, it is evident wheat in all the old settled parts of our State and country would be as sure and productive a crop now as it was when our lands were newly cleared. Whether we shall be able to discover remedies or modes of cultivation by which their attacks may be prevented appears doubtful. Still, every one is aware it is highly important that the habits and transformations of each of these insects should be fully examined, and the information thus elicited should be diffused among the cultivators of our soil. That such knowledge will enable them to elude at least a portion of these depredators, in many instances, there can be no doubt. The following extract from the commencement of a letter from a gentleman in Ohio, written soon after the wheat harvest of 1855, shows what benefits result from knowledge of this kind. He says: "I see from the Country Gentleman that you have become very familiar with the whole insect family. I think that when this subject is brought to bear upon agriculture, horticulture, &c., its usefulness will be unlimited. The farmers here are beginning to see the necessity of some knowledge of

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Entomology; for when they see whole fields of wheat and corn cut off and wholly destroyed by insects, they are in deep trouble, and would spare no pains or expense to get out. A year ago last fall as I was about to sow my wheat, I read very carefully your articles on the wheat fly or weevil as we call it here, and the Hessian fly, and treated the crop according to your reasoning, and the consequence was, I got one-third more wheat to the acre from the poorest of my land than my neighbors did from new ground."

In a document of such compass as the one I here present, embodying such a multitude of observations, upon subjects which have hitherto been but little studied in our country, I do not flatter myself that every thing stated is accurate and free from error, Aware from my own experience in how many instances reinvestigating the structure and habits of an insect causes me to modify and change the opinions which previous observations have led me to form, I cannot doubt that in numerous instances further examinations of the species here treated of will show that amendments are required. I regard these reports as only a foundation, a stepping-stone to further researches in this direction, whereby any errors into which I may have fallen will be corrected and the habits of each particular species will become fully examined and made known. As it is german to this subject, I take the liberty to add a paragraph from a letter which came to hand as my previous report was passing through the press, from Mr. Curtis, whose recent articles on insects injurious to field and garden crops, in the Journal of the Royal Agricultural Society furnish such admirable models for essays of this kind, and whose great work on British Entomology, illustrated with unsurpassed clearness and accuracy, constitutes an endu ring monument to his fame. He says, "I rejoice to find you are setting to work in good earnest with the noxious Insects of America, One of the most important steps is to get their correct scientific names, and as far as possible to identify your species by giving good figures of them. For want of correct names a vast portion of the published accounts by Gardeners and Farmers previous to the publication of Dr. Lindley's Gardeners' Chronicle, relative to economic Entomology, were worthless,

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Wireworms, Bugs and Spiders, meaning anything and everything. You must not hope, however, to arrive at perfection at once; for the greater my experience, the more I am convinced that the first accounts of the economy of noxious insects cannot be made quite correct. So that in fact they become feelers and targets for the critics to fire at. But from such attacks, it is incredible what information may be collected and errors corrected. I am sure you will excuse the liberty I take in thus offering you my experience, and urging you to persevere in exploring the path you have chosen, so full of interest to yourself, and so important to mankind."

Respectfully submitted,

ASA FITCH.

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INSECTS INFESTING FRUIT TREES.

THE APPLE.

AFFECTING THE LEAVES.

Consuming the leaves of apple and cherry trees in May, and forming large cobweb-like nests in the forks of the limbs; black, hairy, caterpillars, with white lines and along each side a row of blue spots; living together in societies.

The COMMON APPLE-TREE CATERPILLAR, or AMERICAN LACKEY MOTH, *Clisiocampa Americana*, HARRIS. (Plate 3, fig. 3, the male; fig 4, the female.)

There is scarcely an insect in our country more universally known than is the one which we are now to consider, when in its larva state, it being the common caterpillar, whose cobweb like nests are everywhere seen, in the month of May and the fore part of June, upon apple and cherry trees. But, though every person is so well acquainted with these caterpillars, there is not one of our citizens who knows the moth or miller into which they change; and those to whom I have shown this miller, have generally expressed their disappointment at finding it so small, so dull colored, and so little ornamented with spots or marks, they having supposed from the size of the caterpillar, and the colors with which it was variegated, that it produced a much larger and more gay looking insect.

This insect pertains to the Family BOMBYCIDÆ, or the thick, hairy bodied moths of the Order LEPIDOPTERA, the silk worm (*Bombyx Mori*) being the type of this group. And the moth of our apple-tree caterpillar in its size and general appearance has much similarity to that of the silk worm, though differing from it notably in its color, and also in some of the minute but important points in its structure, which cause it to rank in a dis-

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tinct genus, named *Clisiocampa*. This genus was formed by Mr. Curtis, for the reception of two common European moths, which are most intimately related, both in their appearance and habits to our American insect, one of them named *C. Neustria*, stripping the foilage from the fruit trees in Europe, and forming its nests upon the trees in the same manner as does our caterpillar. It was hence formerly supposed that our insect was probably identical with the *Neustria*. The botanist Sir James Edwin Smith, however, in editing Abbot's notes and drawings of the Lepidopterous insects of Georgia, deeming that another American moth which has been named *Clisiocampa sylvatica* by Dr. Harris, was the *Neustria*, supposed this was the other European species, and accordingly published it as the *castrensis* of Linnæus. It is to Dr. Harris that we are indebted for setting this subject in its correct light, and showing that both our American species are distinct from those of Europe. And he accordingly named our apple-tree caterpillar *Clisiocampa Americana*, or the American lackey moth, the name lackey being the current English designation for these moths, in consequence of the blue, red and yellow stripes upon the caterpillars having some resemblance to those on the coats in which the lackeys or footmen are dressed. About the only difference which can be discerned between our American lackey moth and the *Neustria*, is in the two stripes upon its fore wings, they being straight and parallel in our insect, whereas in that of Europe these stripes diverge slightly, so that at their inner ends especially, they are more distant from each other than in the middle. But as the colors and stripes are subject to considerable variations, we could not be fully assured that the insects of the two continents are distinct by merely examining them in their perfect state. When we come to look at their larvæ, however, all doubts upon this subject vanish, the caterpillar of the *Neustria* having three red stripes along each side, which do not appear in our caterpillar, and it is destitute of the rows of light blue spots on the sides which we always find in the latter. And if any further evidence was necessary as to the correctness of Dr. Harris in regarding these insects as being distinct species, we have it in some of the habits of the caterpillars. The European insect attacks almost all kind of trees, evergreens

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as well as deciduous. But our American caterpillar is unable, I think, to subsist upon any trees of the evergreen class. A nest of the young worms, on being attached to the limb of a pine tree all died of starvation. A nest of half grown ones, tied among the foliage of a tamerack or larch all forsook the tree in the course of two or three days, without eating any of the leaves that I could discover. Another nest of half grown worms having consumed all the foliage of the bush on which they were hatched, and being obliged to migrate elsewhere, came first to a spruce tree, but passed on without ascending it, as though aware it was unsuitable for their nourishment. And in those rare instances in which single full grown caterpillars may be met with upon the hemlock and pine, they have probably ascended these trees in search of a secure place for spinning their cocoons, and not to feed upon the leaves.

Nor is our caterpillar by any means a general feeder upon deciduous trees. The experiments and observations which I have made, to ascertain upon what kinds of foliage it is able to sustain itself may here be briefly recited. It is well known that it decidedly prefers the wild or native black cherry to any other tree, and next to this it is most fond of the apple, although it is about equally fond of the choke cherry and of the cultivated garden cherry. Its nests may also be occasionally met with upon the bird or small red cherry, upon the wild plum and upon different species of the thorn (*Cratægus*), and I doubt not the caterpillar will thrive and grow to maturity upon almost any of the trees and shrubs which pertain to the natural order Rosaceæ, as I have repeatedly noticed it feeding upon the leaves of the shad bush (*Amelanchier*), the rose, &c. Some of the trees of this group, however, are unadapted to it; the peach, for instance. On the tenth of June, when the caterpillars had mostly attained their full size, a nest was noticed upon a peach tree, below the belt of eggs from which it had hatched. But all the worms in this nest, were at that late date quite small, being only about a third grown. So far as a single observation can be relied upon, it appeared that this tree was unadapted to these caterpillars, and that the parent insect had erred in placing her eggs upon it, probably having mistaken it for a species of cherry.

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But this insect is not entirely limited to trees of the cherry and apple kind. I have seen its eggs placed upon the witch hazel (*Hamamelis*), and the caterpillars from them when nearly mature, appeared as thrifty and well fed as those upon the apple trees. Three small nests, each containing about two dozen worms, were once seen upon a small beach tree. On willows numbers of these caterpillars may be seen every year, when they are nearly mature; and on tieing a cherry twig, containing a nest of worms but two or three days old, to the limb of a yellow willow, they were found to grow as thriftily as those in other situations. The poplars, at least our indigenous species, appear to be equally congenial to them. And the white oak, the leaves of which are small and tender when the caterpillars are nearly full grown, they feed upon freely. The black or quercitron oak seems unadapted to them. The young worms of a nest tied to this tree languished and after a time all died; a nest of half grown worms ceased to advance further in size, and finally the more robust individuals appeared to have abandoned the tree, and the remainder perished. Nests of worms when half grown were placed upon the lilac, the syringa (*Philadelphus coronarius*) and the striped dogwood (*Viburnum Acerifolium*). In each of these instances the nests were forsaken by the worms within a day or two. A nest of worms newly hatched and too young to migrate elsewhere, was placed upon the garden currant, and another upon the alder (*Alnus*). In each of these instances the worms sustained themselves upon the leaves but made scarcely any advancement. When the caterpillars on other trees were mature these had not attained a third their size. They however all continued in their nests, feeding slightly upon the foliage around them, until the period for spinning their cocoons had nearly expired. They then suddenly dispersed themselves and probably all perished, being too small and weak to construct their cocoons. The fact shows that animal life may for a long time be sustained upon food which is so unpalatable and so little nutritious to the individual that no growth or development can take place.

Like other insects, this is much more numerous in particular years. This fact has been noticed from the earliest times. We

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thus have it on record within thirty years after the first settlement of Massachusetts, that 1646 and 1649 "were caterpillar years," and that in 1658 "caterpillars did great harm to fruit trees" (Flint's Agricult. of Mass. 2d report, p. 33). Without specifying other years which have been similarly distinguished, I would state that during the past twenty-five years I have never seen these insects a fourth as numerous as they have been the present year, 1856; and they appear from accounts to have been multiplied to an unusual degree all over our country. And it would seem that those seasons which favor the growth of fruit also favor the increase of these insects, our orchards having never been so overloaded with fruit before as they were in the year 1855.

The eggs from which these caterpillars come are placed near the ends of the twigs, in clusters, forming a ring or rather a broad thick belt, surrounding the branch entirely or in part, as represented (diminished in size) in the annexed cut. In these belts I have counted from three hundred to three hundred and thirty eggs. They are about three fourths of an inch in length and the tenth of an inch thick.

The eggs are of a short cylindrical form with abruptly rounded ends. They are about 0.04 long and two-thirds as broad. The shell is of a very tough leathery texture and of an ash-gray or white color, the inside having a bluish tinge, somewhat resembling that of mother-of-pearl. The eggs are placed perpendicularly upon the twig, to which they are firmly glued, the lower end being indented to give it a more secure attachment to the bark. They are also arranged side by side somewhat symmetrically in rows, their sides being slightly indented or moulded to each other and firmly glued together in one mass. Those eggs which are at the ends or margin of the mass are placed in an inclined position and the outermost ones are laid horizontally upon the bark, in order to produce a gradual slope from the surface of the mass to that of the bark.

The eggs are covered over with a thick coating of glutinous matter which entirely hides them from view and protects them from the weather. This matter is slightly transparent, and full of small air bubbles, giving its surface the appearance of net work. Its color varies from black to pale, but it is commonly darker than the bark, and its outer surface is smooth and shining as though coated with varnish. Although moisture cannot dis-

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solve and wash off this glutinous matter, it softens it, so that it can readily be indented by the finger nail, whenever it is wet by rain or dew. And when thus softened, birds frequently pick into it, forming irregular openings in its surface, as represented at the lower part of the figure in the foregoing cut. They probably suppose it to be the chrysalis of a moth, and that they will enjoy a dainty repast on reaching the inside; but on coming to the outer ends of the eggs and finding how tough and compacted together they are, they desist, never destroying any of the eggs that I have noticed.

These eggs are deposited upon the twigs the fore part of July, and remain through the autumn and winter, and until the latter part of April and the beginning of May, when the young caterpillars hatch from them. Thus during ten of the twelve months of each year these insects repose in their egg state. They always hatch in wet or at least damp weather, when the thick covering of glutinous matter in which they are enveloped is soft, so that they gnaw a passage through it with ease. If it were not thus softened the infantile worms would be wholly unable to work their way through it. If a twig containing one of these belts of eggs be brought into a stove room where the atmosphere is constantly dry, scarcely a half dozen of the worms, if any, will be able to come forth from their nest. And this glutinous matter thus softened, forms a store of nourishment for the worms when they first hatch. They remain clustered together upon its surface and feeding upon it, for one or two days, until they have acquired strength to travel away and forage for themselves.

Thus more or less of this matter is consumed, and the belt of eggs now presents the appearance shown in the accompanying figure, its surface not smooth and shining as before, but rough and ragged, with the white ends of the eggs exposed to view, at least in places, and each egg showing a small perforation in its end through which the worm made its exit.

The infantile worms having fed upon the matter which envelopes the eggs until they have obtained sufficient strength for the journey, move down the limb one after another, each spin-

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ning from his mouth a fine silken thread which he attaches to the bark, whereby his foothold and that of those who follow him is rendered more secure. On coming to a fork of the limb, they halt, and there erect a kind of tent for their subsequent residence, by traveling around the spot, spinning their threads in every direction, hereby forming a web resembling that of a spider. This at first is quite slight, and wholly inadequate to shelter them. Hence if a rain comes on it penetrates the web everywhere, and the young worms may be seen crowded together in a mass, in its driest part, upon the under side of the limb. But thousands of additional threads being added to it each fair day, it rapidly becomes more substantial and better adapted for their protection.

The caterpillars hatch earlier or later as the season is more forward or backward. Commonly the earliest clusters of eggs are hatched by the twenty-fifth of April, and the latest are a fortnight afterwards or even later in giving out their broods; but the worms are mostly out of their shells by the first of May. At this time the apple-trees are as naked as in winter, their buds being merely swollen, and showing the red and green awl-like points of the leaves beginning to protrude from their ends; and the leaves of the garden cherry are also still inclosed within their buds. The wild black cherry, however, is much earlier in putting forth its foliage, its young leaves at this date and also the stems which bear its flowers being half an inch in length. Hence the young caterpillars which find themselves upon the latter tree are most fortunate, having an ample supply of food to meet their wants, whilst those upon the apple and cultivated cherry are obliged to wander about, nibbling what little they can reach in the ends of the buds, and probably are often much pinched with hunger before the vegetation has advanced sufficiently to enable them to feed fully.

When they first come from the eggs these worms are less than the tenth of an inch long, and about the thickness of an ordinary sized pin, their bodies broadest at the head, and slightly tapering, of a black color with pale feet and slightly clothed with fine whitish hairs. At first they merely nibble a small spot upon the surface of a leaf, or perforate a small hole through it,

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or gnaw a slight notch in its side, for a meal, and as soon as they have fed thus much it can be seen that their bodies are more plump, and fine whitish lines begin to appear upon them. As they increase in size, and especially each time they change their skins, their color becomes more diversified. They change their skins five or perhaps six times at intervals of from three to nine days, the worm gaining from an eighth to a quarter of an inch in length each time it throws off its old skin.

When young they go out to feed much less frequently than when they are larger. They move about entirely at hazard in search of food, having no power of smell or other sense to guide them, as I infer from having placed apple and cherry leaves in the direction in which famishing worms were traveling, and seeing them pass quite near and almost touching such leaves without discovering them. Nor when a store of food has been discovered by some of the worms of a starved nest, have they any mode of communicating the information to the others. The rest of the nest probably discover the fact that some of their comrades have obtained a full meal, and thus know that food is somewhere within their reach, but they are obliged to wander about at hap-hazard until they find it. And I have noticed one hungry worm and another after examining the end of every twig upon a limb unsuccessfully for food, on returning down the limb meet several others going out upon the same errand; yet they pass their comrades without those who are coming in having any mode of informing those who are going out that their journey will be wholly fruitless.

As a general rule each nest has its stated hours for feeding and for repose, all the worms going out and returning in a regular procession, one after another. They repair to a particular limb of the tree, frequently a limb which is distant from the nest, and there feed together, occupying every leaf and three or four worms often eating upon one leaf. In pleasant weather they have usually three meals in twenty-four hours, one in the morning, one in the afternoon, and another in the night. But there is much irregularity in all these points of their history. A part of the worms are often at rest in their nest while the others are out feeding. And when they are about to cast their skins

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they wholly cease from feeding for one or two days, remaining all the time within the nest, those portions of the brood which are not ready to moult being at such times the only ones which go out to feed. From the most exact observations which I have been able to make, each worm appears to consume about two-thirds of an apple leaf at each meal—the leaves being small when the worms are young, and fully grown as they attain their full size. A worm an inch long which I confined in a tumbler fifteen days, noting the number and size of the leaves I fed to it, ate on an average an ordinary sized apple leaf, two and a half inches long and half as broad, daily. But thus confined, it took no exercise, and spun no web; and it thus required but half the food, probably, which it would have consumed had it been at liberty. I regard this therefore as confirming the correctness of the observations which I had previously made. It thus appears that each worm devours two leaves daily. And as each nest contains about three hundred worms, every owner of an orchard will perceive that with every caterpillar's nest which he allows to remain upon his trees, the trees lose six hundred leaves daily.

They always travel upon the upper side of the branches and limbs. And each worm, wherever it goes, spins a thread of silk, which not only gives it a more secure foothold, but serves also as a clue to guide it back to the nest again. Much of the traveling of these worms appears to be solely for exercise. As one after another has satisfied himself with food, he comes back to the nest and walks around upon its surface in every direction, thus adding new threads to it. Other worms having also completed their meal, are coming home to their tent every moment. Thus its surface begins to become crowded and is perfectly black with the multitude of full fed individuals which are rambling about upon it, and the throng is constantly becoming more dense with new arrivals from the feeding ground. Hereupon some of them start away, up one of the limbs leading from the nest, and which is covered with cobweb threads from having been so often traveled before. Others follow after these leaders, and the limb through its whole length is soon thronged and black with a procession of worms, going out to its extremity and back; thus making room on the surface of the nest for other individ-

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uals who are every moment returning there from feeding. Having taken this journey to the end of the limb and back and thus had the amount of exercise which they require, they crawl into the tent and there compose themselves to rest. Thus when but a few straggling worms remain upon the limb on which they have all been feeding, a few others will be seen journeying homeward to the tent, a multitude of others will be seen walking about upon the surface of the tent spinning their threads, many more will be seen traveling upon both of the branches which fork off from the tent, some of them going out and others coming in, whilst the inside of the tent is black with the multitude that has completed their labors and retired to repose. The ranks of each of the sections first specified gradually become thinner, until at last all have withdrawn into the tent.

Dr. Harris (Injurious insects, 2d ed. p. 287) says these caterpillars "all retire at once when their regular meals are finished;" and it must hence be inferred from his account that it is after reposing and before going out to feed that they strengthen their nests with additional threads. But from repeated observations I am assured that it is after feeding and before retiring to rest that they add the new threads to their nests. The routine in which they pass their lives consists of the three acts, feeding, exercising, and resting. Dr. H. also says that "At all times when not engaged in eating, they remain concealed under the shelter of their tents." But upon warm days when the sky is serene, they do not retire into their tent at all, but repose upon its outside, which is literally covered with them, and so black that at first sight persons suppose the nest to be a black hat placed in the tree. They are very sensitive to atmospheric changes. Upon rainy days they remain within their tents and do not go out to feed; yet I have repeatedly seen them feeding at night when the leaves were wet with dew, and still oftener in the morning before this moisture had evaporated. On the eighth of May, the worms on a bush which I had taken into my study, went out of their nest to feed in the morning; but it coming on to rain out of doors, they all quickly returned into the nest. I hereupon kindled a fire in the stove and the warmth had no sooner commenced diffusing itself through the room than these

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worms poured out of the nest again and commenced eating, voraciously. And invariably upon very warm days these caterpillars eat much more ravenously than at other times. Two or three days of hot weather, such as frequently occur about the time of planting corn, give them greedy appetites and cause them to advance rapidly in size.

The tent or nest, which is always placed in the fork of a limb, is enlarged from time to time, until it becomes from eight inches to a foot in diameter. It is composed of a number of sheets or layers formed of silken threads woven closely together like dense cob-webs. These sheets are placed parallel to each other, and at such distances apart as enable the worms to crawl between them to repose, the spaces being much narrower between the inner layers, formed when the worms were small, than between the outer ones. The nest thus resembles the several sheets, blankets and other coverings upon a bed, separated sufficiently to receive a row of sleeping persons between each of them. As each new layer which is added to the structure is exactly parallel with the one below it, presenting the same elevations and hollows, it was formerly a query in my mind how the worms were able to place the first threads of these layers, for a scaffolding on which to walk to complete the tissue. But, like many other phenomena in nature which are a mystery to us at first, this becomes quite simple when fully observed. The caterpillars as already stated, repose in serene weather on the outer surface of the nest, lying side by side as compactly as they can stow themselves. Straggling individuals coming in from feeding at this time, to spin their threads upon the surface of the nest, and finding it covered to a greater or less extent by their slumbering comrades, proceed with their work as usual, traveling over the backs of the reposing caterpillars to and fro in every direction, thus spreading a blanket upon them as it were. These caterpillars on awakening from repose, in order to make their exit, crowd the thin threads aside in two or three places, thus forming round holes through the web, which thenceforth become the doors through which they pass in and out of the new apartment. The old portions of the nest become foul, being filled with the shrivelled cast skins and black grains excreted by the worms.

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In almost every nest a few small worms may be seen, not half the size of the others. These do not appear to be individuals which have been stung by parasites, as some have supposed, for I find such dwarfs in nests I have reared within doors, where it is not probable any parasites had ever invaded them. They are probably individuals which have been diseased, or which have been less fortunate than their comrades in finding the supply of food which they required.

Sometimes also one or two very large worms may be found reposing in a nest of small and more lately hatched ones. These are evidently stragglers which have abandoned their own nest, and in wandering about, happening to come to this nest, have crowded into it to repose temporarily. The proprietors of the nest make no resistance to these intruders. Nor do we ever see these caterpillars show any unfriendliness towards one another. When one of them is annoyed in any way, it throws its head spitefully and with a sudden jerk from side to side, and when menaced with danger it holds its head upwards and remains stiff and rigid, or else it drops itself to the ground and there lies perfectly still, as though aware that if it moved its enemy would more readily discover it.

As the black cherry is the favorite of these insects it often happens that trees of this kind which stand solitary in the fields or along the fences, attract the female moths from all directions, and become greatly overstocked with eggs. A hundred nests may sometimes be counted upon a small tree. In such instances before the caterpillars are half grown every particle of foliage upon the tree is consumed and every bud is gnawed to its core. The small amount of succulent matter which continues daily to grow in the buds does not suffice to give a taste of food to a tenth part of the ravenous multitudes. The situation of the worms at such times is truly pitiable. Famishing and tormented with hunger and feeling that a mouthful of sustenance must and can somewhere be found to alleviate the cravings of their appetite, each worm hurriedly crawls for the hundreth time to the end of every limb and twig. The tree thus becomes carpeted over and the angles of the branches become filled with the cob-web-like threads which are spun in these numberless journeys.

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At length driven to migrate elsewhere or perish from starvation, they leave the tree, one following the track of another, traveling in the direction in which they discern or suppose they discern other trees to be standing. If it is pasture land in which they are traveling, every stalk of clover, every dandelion leaf and other weed which they come to is examined to its summit in search of something which is edible. I once saw a heap of dry brush, every limb of which was overspread with the threads of a swarm which was thus emigrating, so little ability have they for discerning where food can be found. Their track may commonly be traced through the grass by the threads which they spin, to a distance of one or two rods, it gradually becoming less distinct as one worm after another has strayed away from it, impatient to find something wherewith to appease his hunger. Being already famished before leaving the tree it is probable that most of them perish before finding anything nutritious on which to feed. The cherry puts forth a scanty crop of new leaves after the worms have left it: and I have known trees to be totally defoliated three and four years in succession by these caterpillars, without being killed. But when thus assailed they grow but little, if any, and acquire a decrepit appearance from which they do not recover for several years.

The LARVÆ when they first come from the eggs are 0.08 long, slightly tapering, of a black color, the under side and legs pallid, and they are slightly clothed with soft gray hairs. After they commence feeding they show a pale ring at each of the joints, and a faint pale stripe lengthwise along the back upon each side of its middle, and another low down upon each side. The head is deep black, and some deep black dots may be discovered upon the body, from which the hairs arise. When they are a few days old and before the first moulting, they have increased to double their original size, and show some ash-gray or whitish lines more or less distincly, running lengthwise upon the back and sides.

A worm which I confined by itself cast its skin the first time on the 6th of May, again on the 12th, a third time on the 15th, a fourth time on the 19th, and a fifth time on the 28th, being now an inch long. I think it would not have moulted again, but as it escaped from its confinement, a week after the last date, I cannot be certain upon this point.

After the first moult this worm was 0.20 long, of a dark gray color with two ashy-white lines along the back and two along each side, the space above the upper lateral line having a large blackish spot on each segment. The hind edges of the segments and the under side of the body was also pale ash

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gray, the head velvety black, and the body was clothed with numerous ash gray hairs of different lengths.

After the second moult it was half an inch long and nearly cylindric, the head being scarcely any broader than the body. It was black and hairy, the neck with numerous long hairs directed forward and overhanging the head, which was velvety black. A broad dull blue stripe extended along the back and a narrower wavy brighter blue one along each side, with several short curved blue lines between them.

After the third moult it was three-fourths of an inch long, with yellowish white hairs, and stripes, &c., much the same as before.

After the fourth moult it was 0.95 long, of a velvet black color with numerous yellowish or fox-colored hairs, with a white stripe down the back and numerous short crinkled white lines on the back and sides; a large black spot on each side of each segment, in the hind part of which spot was a transverse oval pale blue spot having an impressed line across it; a second pale blue spot in the crinkled white lines below the black spot.

The full grown caterpillar is about two inches long and over a quarter of an inch thick, cylindrical, sixteen-footed, and thinly clothed with fine soft yellowish or fox-colored hairs of different lengths, the longest ones measuring a quarter of an inch. These hairs are rather more numerous upon the neck, where they project obliquely forwards, shielding in some measure the head, which is black and furnished with shortish black hairs. The body is of a deep black color. A white stripe extends along the back its entire length, commencing upon the second or the base of the first segment back of the head. In this stripe are numerous minute black dots. On each side of it are a number of short crinkled irregular longitudinal lines, of a yellow color, which become paler down upon the sides. Above the lowermost series of these lines is a row of transverse oval pale blue spots, one upon the middle of each segment. On the anterior side of each of these spots is a broader deep velvety black spot, as it appears to the naked eye, forward of which is a rather faint pale blue oblong spot or short stripe, reaching to the anterior margin of the segment. Lower down the sides are mottled with the same tint of pale blue coloring, interspersed with short crinkled pale yellow or whitish lines. The under side of the body and the legs are black, the soles of the prolegs white. The neck or anterior edge of the segment next to the head is also white, with two small somewhat square yellow spots above.

Early in June, as these caterpillars approach maturity they lose their social habits and leave the trees on which they have been bred, wandering about and feeding upon whatever foliage they find that is palatable to them. Being now so large and well fed, they are able to travel considerable distances, and can sustain themselves on such a variety of plants that they incur little risk of suffering from hunger. For a number of days at this period they may be seen everywhere, on plants in our yards and gardens, or crawling along fences and upon the walls of buildings, and frequently entering our dwellings at the open

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windows and doors. They still prefer the cherry and apple to all other food. One season on looking through an orchard of young apple trees at this time, I was surprised to find some of these caterpillars upon almost every tree. They must have come from considerable distances, as every nest in the orchard and its vicinity had been destroyed two or three weeks before.

It is for the purpose of finding secure retreats in which to form their cocoons that the caterpillars thus disperse themselves. The cocoons are mostly spun about the end of the first week in June. They are placed commonly in a horizontal position, in crevices in the rough bark of trees, on the lower edges of boards where they are nailed to the posts of fences, on the under sides of rails, in the corners at the lower side of clapboards of buildings, beneath the cornices, and in a variety of similar situations where they will be sheltered from the rain. They are held in their places by numerous loose crinkled threads on their outer surface.

The *cocoons* are oval, white or pale yellow, hardly an inch long and 0.40 in diameter. They are rather loosely woven, and so thin that the inclosed insect may be discerned through their sides. Their meshes, however, are filled with a kind of thin paste, which when dry crumbles to a fine powder resembling sulphur, which sifts from the cocoons when they are handled. The loose texture of the cocoon enables the moth when hatched to crowd itself out through one end of it, forming a large round opening therein, and giving to this end afterwards the blunt appearance shown on the left end of the above figure. The moth also discharges a colored fluid which wets and softens this end of the cocoon and thus facilitates the operation of working a hole through it; and this fluid also stains the orifice to a greater or less extent, making it a light tawny yellow color.

The *chrysalis* which lies within this cocoon is variable in its size, measuring 0.65 to 0.80 in length and about 0.28 in thickness. The accompanying figure will give the reader an idea of its appearance. Its surface is densely covered with fine short erect hairs, except upon the head and the sheaths in which the wings, legs and antennæ are inclosed,

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When first formed it is of a dull white color with the head pale green and a pale brown stripe along the back; but it gradually changes to a darker color, and the shell which remains in the cocoon after the insect has come from it is sometimes black and sometimes chestnut brown irregularly spotted and blotched with black.

Dr. Harris states that the chrysalis state of this insect lasts from fourteen to seventeen days. The specimen which Abbot bred was twenty-six days in its pupa form. Of nine early matured caterpillars which I had placed in a box the first formed its cocoon on the morning of June 2d; two others spun themselves up in the afternoon and two others in the evening of the same day, and the remaining four enclosed themselves the following night. The first moth was found in the box on the morning of June 23d, four more were found in the box the following morning, three more came out in the course of that day, and the remaining one that night. Three weeks thus appears to be the usual period that these insects repose in their pupa state.

The WINGED MOTHS (see plate 3, fig. 3, 4) are of a dull reddish or fox color, different individuals varying in the depth of their coloring, the females (fig. 4) being often paler, approaching to grayish, and the males (fig. 3) often darker, sometimes brown with scarcely any tinge of red. The mark by which this species is most readily distinguished is two straight white stripes which extend obliquely across the fore-wings, parallel to each other and to the hind margin, dividing the wing into three nearly equal portions. The anterior stripe is often slightly broader than the posterior one, especially towards the outer margin of the wing. In some females these stripes are placed nearer to each other; and though commonly parallel, in some instances from the middle of the wing to the outer margin, or even through their entire length they diverge from each other. In the males they are less variable, but the space between them in this sex is frequently pale gray, and there are also numerous gray hairs on the basal portion, and a few towards the apical margin also. The hind wings are of the same color as the anterior ones, but without any pale marks. On their under sides the wings are the same color as above, and commonly a white band extends across both pairs near their middle, that on the fore wings being straight and widened at its outer end, that on the hind wings broader and curved. The fringe on the fore wings has a white alternation near the outer angle and another broader one on the middle; along the inner angle and on the hind wings it is white slightly varied in places with dull reddish. These colors of the fringe are much more distinct in the darker colored varieties of the male. The hairs with which the thorax is densely coated are often grayish. The stalk of the antenna is dull white and its branches are dark rusty red, sometimes with a whitish line on their outer side. The feet are white or yellowish

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white, particularly in the males. The wings when spread measure from 1.20 to 1.30 in the males, and in the females from 1.40 to two inches.

The following VARIETIES may be noticed.

I. In the *males*.

a. The space between the bands on the fore wings pale gray. Common.

b. The bands undulated near their outer ends.

c. The basal outer half of the hind wings whitish.

d. The hind wings with a whitish band across their middle.

e. The whitish band on the under side of the fore wings wanting.

f. The whitish band on the under side of both wings obsolete or wanting.

II. In the *females*.

g. The bands on the fore wings unusually distant, the middle space of the wing wider than the hind space.

h. The bands unusually near each other, the space between them more than four times as long as wide.

i. The bands perceptibly diverging from the middle of the wing to its outer margin.

j. The bands slightly diverging through their whole length from the inner to the outer margin.

These moths are most numerous about the end of the first week in July. They pair and the females deposit their eggs within a day or two after they come from their cocoons. Thus the belts of eggs begin to be seen upon the twigs of the apple trees as early as the first of July. Like other insects of this group, these moths frequently enter the open windows of our dwellings in the evening, attracted by the lights. A dozen will sometimes come in thus, in an hour or two of a sultry dark night. It is readily known from other species at such times, by its motions. Dazzled and bewildered by the light, it darts crazily about, here and there, thumping against the table, the wall and the floor, and instantly rebounding it circles around the candle with Jehu-like velocity, till it blurts through the flame, nearly extinguishing it and singeing its horns and wings, when it is glad to withdraw to some obscure corner and there remain at rest.

This moth inhabits all parts of the United States. Persons who have removed from New-York to Illinois and Wisconsin inform me that they have these caterpillars in their orchards there, but that they are by no means so common as here at the east. Abbot remarks that in Virginia whole orchards are stripped of their leaves by them, but that in Georgia it is not very common. From the specimens of the moths which have been sent me from Mississippi and from the Indian territory west of

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Arkansas, I should judge it to be common through the south western states. And it probably occurs over all those parts of our continent where the black cherry is a native tree.

Another caterpillar which has already been mentioned, named *Clisiocampa sylvatica* by Dr. Harris, or the Forest caterpillar, is so very similar to the insect we are considering, in its appearance and habits, that it merits a notice in this connection, but as I have not enjoyed an opportunity for carefully noticing its history and transformations, I shall only allude to it briefly at present. It is most fond of the oak but it is also frequently met with upon the apple. Here at the north it is far less common than the other species, and I have only occasionally met with one of its nests, and with the caterpillars when they were wandering about in search of retreats in which to spin their cocoons. But in Virginia it is so abundant some years, according to Abbot, as to strip the oaks of their leaves. Among my neighbors it has the reputation of being more injurious to apple trees than the common species, as it not only consumes the leaves, they say, but gnaws the stems of the young apples, causing them to wither and fall to the ground.

These caterpillars build their nests against the side of the tree instead of in a fork of the limbs. The worm has the same form and size and is clothed with hairs similar to the common species, but may easily be distinguished from it by its color and stripes. It is pale blue tinged with ashy greenish low down on the sides, and is everywhere sprinkled over with black points and dots. Along the middle of the back is a row of white spots and on each side of these an orange yellow or tawny reddish stripe, and a paler cream yellow stripe lower down on each side, these stripes and spots being margined with black; and each segment has two elevated black points upon the back, from each of which arise four or more coarse black hairs. They are rather later than the common caterpillars in spinning their cocoons and in giving out the winged moths, and these moths resemble those of the common species, being of a cinnamon brown color, the fore wings paler or nankin yellow, crossed by two oblique straight parallel stripes of a rusty brown color, and the whole space between these stripes is in many specimens rusty brown.

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The caterpillars which are seen wandering about, everywhere, the fore part of June, all disappear by the middle of that month, having wound themselves up in their cocoons. Straggling individuals, however, may be met with after this time. So late even as the fourth of July, when the winged moths are generally out of their cocoons, I have met with individual caterpillars still lingering upon the leaves of apple trees. Several of these late stragglers I have confined in boxes, deeming they might be infested with internal parasites. But in every instance they refused to eat, and have died within a few days and their bodies have become putrid, and no parasites were to be found within them when examined. Hence it is probable that all these late individuals are diseased and too debilitated to spin cocoons, and that they all perish. It will not therefore be worth while to give any care in destroying them when we happen to meet with them.

When the caterpillars disperse themselves abroad, a few remain upon the tree and continue to occupy the nest. These also appear to be diseased individuals which are too feeble to roam abroad like their comrades. And they eventually form their cocoons within the nest. Thus on tearing open old nests a few cocoons will almost always be found in them. Some of these yield winged moths, but the insects in most of them are destroyed by parasites. There are probably different species of Ichneumon-flies and kindred insects which prey upon and destroy the Lackey moth in its larva and pupa state. Sometimes a very small white cocoon not half the size of a grain of wheat, and of a texture like that of the silk paper on which bank bills are printed, may be found slightly attached to the outer surface of the cocoons of the Lackey moth. The insects make their escape therefrom by cutting one end of the cocoon nearly off and pushing it up like a lid. These small cocoons are probably formed by parasitic worms which feed upon and destroy the inmate of the larger cocoon and make their way out of its body as soon as they have attained their growth.

Many of these cocoons which are found in the old nests of the caterpillars have a large hole perforated in them near one end, this perforation also extending through the shell of the chrysalis. In July and the fore part of August a multitude of minute Chal-

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cidian insects of a deep metallic green and black color, may be found issuing from this orifice, being doubtlessly hatched from small maggots which have subsisted upon the chrysalis. Why the orifice is so much larger than is necessary for their exit I am at a loss to conjecture. These same insects may also be seen at the same time, walking around upon the exterior surface of the nests and the limbs and leaves around it. They appear to pertain to the genus *Cleonymus* of Latreille, as this genus is restricted and defined by Westwood (Synopsis of British Genera, p. 72) and by Brullé (St. Fargeau's Hymenopteres, vol. iv. p. 594), and this species may appropriately be named

The Lackey-moth Cleonymus (*C. Clisiocampæ*). The males are about 0.09 in length to the tip of the abdomen and of the wings, and the females 0.11. The head and thorax are somewhat rough from numerous minute elevated points giving their surface a shagreened appearance. They vary in color from dull metallic green to black, being the former color commonly in the males, the latter in the females, with the face green in both sexes and sometimes with a golden yellow reflection. The abdomen is smooth and highly polished, black or purplish black, immaculate in the females, in the males with a large pal yellowish spot near the base above and beneath, varying in its size in different individuals, the sutures also being more or less marked with the same color. The antennæ are black or dark brown, their long basal joint pale dull yellow, which is also the color of the legs the tips of the feet being black, and in the female the thighs are more or less dusky or brown. The wings appear whitish when closed and carried flat upon the back as they are when the insect is walking. When spread they are hyaline and glassy, their whole surface covered with minute punctures, each bearing a fine short hair. The stigma or short thick branch at the end of the rib-vein is slightly enlarged and triangular at its apex, the angle which is towards the outer margin being prolonged into an acute point, this stigmal branch being hereby curved on its outer and straight on its inner side. The thickened rib-vein is confluent with the outer margin about three times the length of the stigmal branch before giving off this branch. The antennæ are eleven jointed, the joints beyond the first compacted and forming an elongated club, the third and fourth joints being much smaller than the others, the third but half the size of the fourth and often difficult to perceive. The second joint is longer than the fifth and following ones. The last joint is double the preceding. The male is more slender than the other sex and has the abdomen oval and convex above, its segments faintly marked by slender transverse impressed lines, the fifth segment being longer than the fourth. In the female the abdomen is broader than the thorax and has an ovate form tapering to an acute point. It is flattened above and strongly protuberant in the middle beneath.

In the old nests of these caterpillars, in August, the larva of a moth, probably of the family Tineidæ, is common. It is a slender sixteen-footed soft fleshy worm over a third of an inch long,

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of a dull reddish color with a black head and neck. It subsists upon the old effete matters of the nest, or perhaps consumes the shells of the chrysalids after the moths or their parasites have come from them, for cocoons frequently occur from which these shells have disappeared.

For destroying these caterpillars a variety of measures are resorted to by different persons in all parts of our country. Whilst some of these are more or less efficacious others are puerile and worthless, and some do the worms more benefit than harm.

I have known persons to content themselves with simply thrusting a stick into the nest and tearing it asunder and knocking or shaking the worms to the ground, thinking that few of them would be able to find their way up the tree again and that at least a part of them would perish from starvation. Such persons have no correct conceptions of the distances which these caterpillars can travel and the variety of leaves on which they can subsist.

I have known other persons to tear open the nest and pour water into it till it was saturated, thinking this operation drowned the worms. And in former years I was myself accustomed to cut off the limbs containing nests upon the choke cherries in my meadow and throw them into the adjacent creek, supposing the worms would thus be drowned and become food for fish. I have since learned that in this act I was no more wise than the sages of Gotham when they sat about destroying an eel by drowning it. I have known one of these worms after being immersed under water two hours revive and crawl away on becoming dry. Nor is hot water more efficacious. Several nests of quite young caterpillars, through which water that was near the boiling point was profusely poured were next day found all alive and apparently unharmed by the operation.

I have sometimes poured soap suds into the nests and upon the worms when exposed upon the limbs and leaves. When wetted in this manner they shrink up and fall to the ground, dead as I have supposed, but I am not certain that none of them have revived again when thus treated. Some persons have used ley in the same manner, and this is undoubtedly more destructive. A swab charged with spirits of turpentine or with whale oil soap

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and thrust into the nest, it is said will kill many of the insects and compel others to escape.

Burning the nests and thus destroying the worms when at rest within them, has been recommended. A very neat method of effecting this was given by Prof. Mapes at the meeting of the Farmers' club of New-York on the fourth of September last. It is to saturate the nest with a mixture of alcohol and camphene and set it on fire. I have not tested the efficacy of this mode, but, clustered together in a mass as the worms commonly are in their nests I should be fearful those in the inner part of the mass would not be killed by the transitory heat thus produced, since hot water fails to destroy them. Another method which has often been resorted to is to hold to the nest the muzzle of a gun lightly loaded with powder and discharge it. I have been informed that only a part of the worms are commonly destroyed by this operation.

Sulphur has been in higher repute and has been oftener resorted to in this country than any other remedy, for expelling caterpillars and all kinds of worms from trees. A hole is bored in the trunk of the tree to the depth of about six inches; this is filled with sulphur and a plug is inserted to retain it from being washed out by the rain or by sap flowing from the wound. This remedy obtained much currency from the experiments of the late George Webster of Albany, reported in the Memoirs of the old New-York Board of Agriculture, vol. ii, p. 250, and extensively copied into other publications at that period. And like Mr. Webster, many others have become assured of the efficacy of this remedy, from the mere fact that the worms have all disappeared from the infested trees within a day or two after this measure has been resorted to. Now there is a peculiar liability to be deceived and misled, by experiments like this. The larvæ of insects generally, become most voracious and make the greatest havoc, just as they are arriving at maturity. And as they are now grown to a larger size than they had previously been, they commonly are not noticed until this time. Having nearly completed their growth, they of course forsake the tree which they infest within a few days. Persons not conversant with the habits of these vermin, will hence suppose the remedy which they

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have applied has driven them from the tree; whereas it is their natural habit to crawl from the tree at this time. Now in all cases like this it is an easy matter to conduct an experiment in such a manner that there can be no deception or mistake in the result. Obviously, if sulphur, applied in the manner stated, has any effect in rendering a tree repulsive to the worms infesting it, it is in consequence of its being absorbed and circulated in the sap to every limb and leaf of the tree. For the purpose, therefore, of ascertaining the effect of sulphur upon the apple tree caterpillar, I on the third of May cut off the limb of a wild cherry tree on which was a nest, the worms of which were a quarter of an inch in length, and inserted the but-end of this limb in a cup of sulphur slightly moistened with water—whereby the twigs and leaves would certainly become much more strongly impregnated with this substance than they ever can be from sulphur inserted in a hole bored in the trunk of a tree. A limb containing another nest was also cut off and inserted in a cup containing water only. These two nests were placed side by side in my office, where they would be subject to the same temperature and influences, except in the one particular specified. As the leaves upon the first mentioned limb became consumed by the worms, a fresh limb the but of which had been inserted in moistened sulphur during the twelve hours preceding, was placed in contact with it. Sulphur was also sprinkled upon a part of the nest. But the worms seemed to wholly disregard this, traveling freely around and over it, and soon inclosing it under the newly woven tissues of their nest. At the end of nine days the caterpillars in both nests were larger than any of those out of doors, the temperature of the office warmed by a stove upon chilly days and evenings, having evidently favored their growth. At this time, May 12th, the worms which had fed upon ordinary leaves were four-tenths of an inch in length; those which had subsisted upon leaves impregnated with sulphur were double their size, measuring 0.80 to 0.85. It was clearly apparent, therefore, that so far from being in the least degree prejudicial to them, the sulphur had rendered them more healthy and robust, rapidly accelerating their growth. And it hence is quite probable that those hundreds of persons in our country who

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have spent more or less time in inserting sulphur in the trunks of trees infested with worms have hereby benefitted these vermin more than they have injured them.

Soap being so efficacious a remedy against some insects induced me to test its effects upon these. A nest of late caterpillars, only half grown upon the last day in May, were upon the limb of a small garden cherry, when I placed a band of soft soap around the limb, slightly below the nest. Several worms started out of the nest to feed, but each on touching its nose to the soap retreated back hastily into the nest. Three worms coming in from feeding, on touching the soap, turned about and crawled away from it, whereupon I placed a second ring around the limb, below them. On coming to this they again turned around, up the limb, and continued traveling backwards and forth from one barrier to the other, without attempting to pass either of them. My hopes were high that this substance would prove invaluable in combating these insects. Other rings quarentining more worms, were placed around other limbs, and a quantity of the soap was put in the forks of all the larger limbs. But, two hours afterward, the surface of the soap having become dry so as to give the worms a foothold, they were found everywhere traveling over and scarcely noticing it.

Next, to ascertain whether the alkaline matter of the soap would be absorbed and pass into the circulating juices of the tree and impregnate the leaves sufficiently to render them unpalatable to the caterpillars, the main trunk of the tree from near the ground to the limbs, a distance of five feet, was profusely coated over with soap, and some of the larger limbs were also rubbed with it. A slight rain coming on aided in washing this substance into the small crevices of the bark. But I could not discover that it had any effect upon the worms. They continued to feed and to thrive upon this tree. A fortnight afterwards, when the caterpillars had almost universally forsaken the trees, a few were still remaining upon this tree. And I may add that the leaves of this tree after the soap was thus copiously applied to it, appeared as much infested with the black aphides or cherry plant lice described in my First Report, as were the leaves of other trees around it. It thus appears that this sub-

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stance is not such a sovereign prophylactic against all insects upon fruit trees as the observations of some of our most successful fruit growers have led them to suppose. And there can be no doubt that in this as in the higher classes of animals, what is poison to one may be meat for another.

There are two measures only which we can confidently recommend, whereby to subdue these insects and save the fruit trees from defoliation by them. And these universal experience concurs in pronouncing the only efficient and reliable measures to which recourse can be had.

The first of these is destroying the eggs. This must be attended to in the winter or early in the spring before the leaves begin to put forth. As this is a period of the year when other avocations leave us comparatively at leisure, it is economy to accomplish now whatever can be done which will diminish the demands upon our time during the busier parts of the year. And every cluster of these eggs which can be discovered can be much more easily and speedily destroyed than a nest of caterpillars can be exterminated at a later date. The orchard should therefore be carefully passed through at this time and the ends at least of all the lower limbs should be examined. And for this work it is necessary to call into exercise the sharpest scrutiny which we are able to give, for despite of our utmost care some of these clusters will elude our search. A practised eye will detect the unevenness or swelled appearance of the twig where these eggs are placed, much more readily than that of a novice. They are sometimes at the very end of the twig, sometimes one or two feet from its extremity, and not unfrequently two belts of eggs occur upon the same twig. The eggs are to be gathered either by cutting off the twig to which they are attached or by breaking and tearing them from the twig. They should be carried to the house in a basket and thrown into the stove, for if merely dropped upon the ground the worms will afterwards hatch from them and many of these will be apt to find their way to some tree or shrub on which to subsist. There perhaps has never been more urgent necessity for a universal resort to the measure now specified than there will be the coming winter, the trees being stocked with eggs at the date when these pages are

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going to the press, to an extent never before known. Persons who have never seen these eggs upon their trees hitherto, now notice them frequently, notwithstanding the trees are in full leaf. And should the season prove favorable to them, and no artificial destruction be had recourse to, our orchards bid fair to be stripped of their foliage next year to an extent never before paralleled.

But, as already stated, notwithstanding the most searching scrutiny, many of these clusters of eggs will escape notice, particularly upon the higher limbs of the trees. The proprietor of an orchard, therefore, is often vexed, after entirely ridding his trees of the eggs of these insects, as he supposes he has done, to find nests of caterpillars appearing upon them when the leaves are beginning to put forth. A second measure, the destruction of the caterpillars, therefore becomes necessary. And certainly the most expeditious and effectual method for accomplishing this is to crush them when they are gathered together and reposing in their nests. Practical orchardists are quite unanimous upon this subject, although in killing the worms there is some diversity in their practice. The best method is that stated by the late Willis Gaylord: "With a suitable ladder and a pair of stout mittens, if you are fastidious about using your hands, * * * when the worms are all in their web, at a single grasp every occupant may at once be destroyed." (Trans. N. Y. State Agric. Soc., vol. iii, p. 153.) Those, however, who are at all squeamish in encountering work of this kind, which it must be confessed is more agreeable when done than when doing, prefer tearing the nest from the tree and trampling its contents into the earth beneath the sole of the boot. By thrusting a stick or pole through the nest as low down in the fork of the limbs as possible, and then raising it outwards, nearly the entire nest and its occupants can be removed from the tree, when there are no small lateral limbs growing within the fork to catch and retain portions of it. Others thrust into the nest a cylindrical brush constructed by the manufacturers for this purpose, or the top of a dry mullen stalk, attached to a pole for those nests which are high up in the tree, and turning it about in such a manner as to wind the nest around it, by pressing and rubbing it against the limbs, hereby

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crush most of the worms, and complete the work by returning to the nest on a subsequent day and repeating this operation. Whichever of these methods is adopted, the work is in all cases the most easily performed and the least disgusting, when the worms are young and small. It should therefore be done early in May, as soon as the white nests, appearing like cobwebs in the forks of the limbs, become sufficiently conspicuous to be readily seen. The worms of some nests will be out, feeding, at the same hours when others are resting within their tents. They are more universally in their webs in the morning than at any other time. But days during which there is a slight sprinkling rain are probably the best for this work, as the worms are then all in their nests, as a general rule, and are more torpid and less apt to crawl away; though the nests when wet are not so easily discovered. Often, too, when from the number of worms reposing in the nest we imagine the whole of the brood is there, a portion of them are in reality absent, engaged in feeding. Thus it frequently happens that when we suppose we have entirely exterminated a nest, on returning to it a few days afterwards we are surprised to find it rebuilt and quite a number of worms inhabiting it. In order therefore to entirely destroy these pests, it is necessary to go through the orchard repeatedly. And every owner of an orchard should make it a point to wage a war of extermination against these insects, annually. Not the fragment of a nest which is accessible should be allowed to remain. The rich green foliage in which the trees will be clad when released from this most common enemy, and the quantity and fairness of the fruit which they are then enabled to grow, will amply repay the care which is thus bestowed upon them. Within the circuit of my own observation I presume one-half the owners of orchards give no attention whatever to the caterpillars which yearly invade their trees. Most of them are men of such strict economy they think they cannot afford to spend their time in such trifling work as destroying these worms' nests. Now it requires but a few moments, with a suitable ladder, to mount into a tree and with one hand covered with a buckskin mitten, crush every worm in the nest there. Ten of these nests can thus be destroyed with ease in an hour. Each of these nests contains

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about three hundred worms, and each worm, as already stated, devours two leaves daily. Six hundred leaves are each day stripped from each tree on which there is one of these nests. An hour's labor therefore saves to the orchard six thousand leaves daily, for the space of two or three weeks. Where else can an hour's labor be so profitably devoted as in destroying these worms? Surely men who are such close economists, when they are apprised of these facts, will never allow one of these nests to remain upon their trees for a single day.

Some persons do not allow any wild cherry trees to grow on their lands, in consequence of the numbers of these caterpillars which they breed. But the orchards of such men are probably about as much infested with these insects, coming in to them from the fields and forests of their neighbors, as they would be were wild cherries growing upon their own lands. And valuable as the timber of this tree is for cabinet work, we cannot recommend its extermination. It appears to be the young, thrifty growing trees of this species which are the especial favorites of these insects. Large old trees are rarely infested to a great extent, especially when trimmed of their limbs to a considerable height from the ground. And even if every wild cherry tree in our country was cut down and not a caterpillar's nest was tolerated in any of our orchards, these insects would continue to sustain themselves, though no doubt in greatly diminished numbers, upon the other species of cherry and upon the thorn apples and other trees and shrubs on which they are able to subsist and thrive.

As the wild black cherry is so much preferred to the apple or any other tree by these insects, and as it is easier to destroy a hundred nests upon one tree than a quarter of that number where they are scattered upon different trees, it strikes me that this tree may perhaps be turned to a valuable account as a decoy for these insects. If one or two cherry trees are standing in the fences on each of the sides of an orchard, the eggs of these insects it is probable will nearly all be deposited upon these trees which otherwise will be scattered over all the trees in the orchard. These trees can be kept trimmed and headed down so that all parts of them will be readily accessible. The ends of

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the limbs, moreover, are so much more slender, long and straight than those of the apple tree, that the eye detects the belt of eggs upon them far more readily than upon the latter tree. Hence a hundred clusters of eggs or a hundred caterpillars' nests upon a half dozen cherry trees on the outer edge of the orchard can be exterminated much more easily than half that number upon forty or fifty apple trees within the orchard. And the work when brought within so small a compass can be much more completely accomplished, leaving nothing to produce a crop of these vermin another year, except what straggles in from the surrounding premises of shiftless neighbors. Every reader will perceive the plausibility of the measure now suggested; but it is only after testing it by carrying it into practice, that we can know with certainty whether it will fulfill our expectations.

Eating the leaves, in July; a slender caterpillar with pale yellow hairs and tufts and black pencils, its head and two small protuberances on the hind part of the back bright coral red.

In winter, clusters of white eggs and a dead leaf adhering to a whitish cocoon attached to the twigs or limbs.

The AMERICAN VAPORER MOTH, *Orgyia leucostigma*, ABBOT and SMITH.

The term "caterpillar" is applied to a worm which is clothed with hairs; and we commonly associate this term with something which is ugly and repulsive in its appearance. But many caterpillars are far from meriting this prejudice, being in reality objects of much beauty. This is eminently the case with one which may frequently be seen in the month of July upon apple trees, and also in our yards upon rose bushes. We cultivate the rose for ornament; and nature, as if to further our designs, places upon the leaves this neat prim little caterpillar, which is a more delicate, elegant object than the handsomest rose that ever grew. I well remember the first time I noticed one of these caterpillars. It was in the hay-field, in my boyhood. One of the laborers, who had little taste for any of the beauties of nature—a man of that class of whom the poet sings,

> "The primrose growing by the river's brim
> Is but 'A yellow primrose'—nothing more—to him"—

in stooping for a handful of grass to wipe off his scythe, had his attention arrested by one of these caterpillars. Taking up the

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leaf on which it was standing, he was for several moments absorbed in contemplating its bright colors and the artistic arrangement of its elegant plumes. Then, as he was laying it down he said to himself, "That is the prettiest thing I ever saw!" Let us not murmer, if the leaves of our rose-bushes are somewhat gnawed and eroded, when they hereby produce for our admiration objects far more beautiful than we look for them to yield.

These *caterpillars* are an inch or more in length, slender, sixteen footed, and have the skin of a cream yellow color with a black stripe along the middle of the back and a broader brown or black one upon each side. The body is thinly clothed with pale yellow hairs which radiate from small wart-like elevations, and in a row on the fore part of the back are four brush-like tufts of a deeper yellow color. On the hind part of the back are two little knobs or bosses of a bright coral red color, or like sealing wax, and the head is of the same color. Projecting upward from the hind end of the back like a camel's hair pencil is a bundle of long black hairs, and inclining forward and outward from each side of the neck is a similar pencil. The hairs of these pencils are minutely bearded through their whole length, and each hair has a small knob at its end, which is formed of a tuft of minute bristles. The pencils have a jointed appearance, from their hairs being in sets of different lengths. The yellow hairs are also bearded, but have no knobs at their ends.

I have, on willows and on basswood met with caterpillars differing from the preceding in having the head yellow, no red knobs upon the back, a black spot behind each of the brush-like tufts except the first, and beyond these a deep yellow instead of a black stripe, and no brown stripe along the sides. Whether these are a distinct species, or only a variety, I am unable to say, two individuals which I reared having proved to be wingless females.

These caterpillars do not associate together in companies, nor form any web for their protection, but live solitary, exposing themselves openly upon the leaves and in the glare of sunlight, as if they thought that no creature would have a heart to injure anything so pretty as they are. They eat irregular notches in the margins of leaves, and where they are very numerous they consume the whole of the leaf, leaving nothing but the mid-vein. They feed upon many different kinds of trees, the elm, the maple, the horse chestnut, the oak, &c., but they appear to be most fond of the apple, the plum, the rose, and other perennials belonging to the Family Rosaceæ. They attain their growth and spin their cocoons mostly during the latter half of the month of July. The cocoons are attached to the twigs and limbs of trees, and sometimes to the leaves, and also to the posts and rails of fences, it probably being some of those caterpillars which are to produce male moths which select the latter situations. The cocoons are

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formed of whitish silken threads so loosely woven together that the enclosed chrysalis can often be seen. They consist of an outer and an inner covering or tunic. The outer covering is commonly formed in part of two leaves, which are bent and tied together in such a manner as to make a kind of roof, sheltering the cocoon from rain, the lower leaf being overlapped by the lower edge of the upper one. There is considerable diversity, however, in the mode in which the leaves are attached to the cocoon. Sometimes they are drawn around it in the form of a cone with its point upwards. Sometimes but a single leaf is used. I once met with one of these cocoons upon the upper surface of a butternut leaf, the sides of which were drawn upwards so that the leaf formed half of the exterior portion of the structure. And as if the worm was aware of the brittle attachment of the leaf to the main stem, and was conscious that its own weight added to that of the leaf would inevitably cause it to break off and fall should a gale of wind arise, it had spun several threads to the main stem, thus securely tying it thereto. It is impossible for us to conceive how this worm came to possess such knowledge. The main stem would have fallen with the fall of the leaves in autumn. This cocoon produced a male moth. The female caterpillars undoubtedly place their cocoons, in every instance, where they will remain upon the tree through the winter; whilst the males are indifferent in this matter, caring for their safety only for the short time they remain within them. This is a signal instance of the harmony of nature, as will appear when we come to see where the eggs of the female are deposited.

Woven into the cocoon are numerous black and pale hairs, derived from the body of the caterpillars; and the remains of plant-lice are sometimes interspersed, probably from these stupid creatures having wandered over the cocoon at the time of its construction, and becoming inextricably involved in its meshes. The cocoon is about an inch and a half long. The inner tunic is but half the size of the outer, the space between being occupied with single threads crossing each other in every direction, and with the shrivelled remains of the caterpillar lying in the lower end. This inner covering is a closed sack of a regular oval form,

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smooth on its inside, and a little larger than the chrysalis which reposes within it. The cocoon is placed indifferently either in a perpendicular, an oblique, or a horizontal direction.

The *chrysalis* is of an oval form, twice as long as broad, measuring from 0.60 to 0.70 in length. It is rounded anteriorly and drawn out into a little horn-like point at its hind end, furnished with minute hooks at its tip, which are fastened into the threads of the cocoon. It is of a brown color with pale clouds and the under side of the abdomen whitish. Sometimes it is black and shining, with scarcely any traces of whitish. Upon the head back and sides it is thickly covered with rather long fine white hairs. The three anterior segments next to the head have each upon their middle, above, an oval or square transverse spot of a pale clay color, formed of scales which resemble little collapsed vesicles or bladders, and each of these spots is crossed by a slender line upon its middle. The wing-sheaths appear to be of the same length in both the sexes, reaching to the anterior edge of the first abdominal segment. On breaking open a female chrysalis, its inside is found filled with eggs which appear to be grown to their full size.

In each instance when I have bred these insects, the moth made its appearance on the thirteenth day after the cocoon was spun. It therefore begins to appear abroad upon the wing about the first of August. We sometimes, however, meet with the chrysalis unhatched in the cocoon in the winter. These are doubtless individuals which have been later in completing their growth and from which moths will be given out early in the following spring. From the gay appearance of the caterpillar one would expect a very pretty moth to be produced by it, and will be disappointed on obtaining a dark sooty brown thing, little variegated with spots or streaks. These moths may sometimes be seen resting upon the door posts or the shady side of buildings, with their fore legs stretched out in front, and their antennæ elevated. They frequently enter open windows in the evening, attracted by the light. They fly also in the day time. Their mode of flight is peculiar, consisting of short jerks or in a flirting manner. This has probably obtained for insects of a similar kind which occur in England, their common name, vaporer moths, a term indicating something of a volatile, peevish, hysterical disposition. They pertain to the genus *Orgyia* in the family ARCTIIDÆ and order LEPIDOPTERA, and this species is named *leucostigma* or the Pale vaporer moth, in the splendid work of Abbott and Smith upon the Insects of Georgia, plate 79. The epithet "pale," however, is inappropriate for these moths as they occur

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in the State of New-York. Indeed the specimens which I meet with in Washington county, fifty miles north of Albany, are so uniform in their characters, and so unlike the insect figured and described by Abbott and Smith that I should deem them a distinct species, were it not that the caterpillars, which are so peculiarly colored and clothed, appear to be identical with those of Georgia, and specimens of the moths from the vicinity of the city of New-York are intermediate in their marks, between the more northern and the Georgia insects, thus indicating that there is a gradual transition from the one to the other.

The *winged moths* as they occur in the Southern States, appear from the representations given, to be of a pale gray or ash color, the fore wings with a white crescent near the inner hind angle, and crossed by two conspicuous curved black bands, the hind one of which and the black spots upon these wings are nearly as in the following variety.

The intermediate variety (*O leucostigma* var. *intermedia*) which occurs in the southern part of New-York measures about 1.40 across the extended wings. The fore-wings are ash-gray, their basal third smoky brown, paler on the inner side and crossed by a faint wavy pale band, which is confluent outwardly with an ash-gray cloud which extends from this band to the base. A blackish crinkled band commences on the inner margin behind the middle, running inward and then curving backward, till it approaches the outer edge, when it abruptly turns forward almost at a right angle and extends straight in an oblique direction more than the tenth of an inch to the outer edge. In the middle of the pale gray space forward of this band is a slender black crescent having some resemblance to the letter L, with a dot between it and the outer margin, a slender black line sometimes reaching with a curve from the crescent to the dot. The wing back of the band is pale smoky brown, except towards the outer margin, where it is pale gray, with a rhombic black spot on the margin immediately behind the band, this spot being cut across longitudinally by a slender gray line. Inside of this spot and much nearer the hind edge are two smaller blackish spots or streaks. Near the inner hind angle is a large white comma-like dot having its tail towards the inner edge. From this dot a pale streak often extends across the wing, parallel with the hind margin. The fringe is smoky, crossed by pale lines at the tips of the veins.

In the northern variety (*O. leucostigma* var. *borealis*) which is met with in the more northern sections of the State, the wings when spread measure from 1.20 to 1.30. Both pairs are alike in color, being dull smoky or dingy brown. The upper ones have a large ash-gray patch on the middle of the outer margin, which commonly extends to the tip, and is crossed by an oblique blackish streak, which is all that can be perceived of the band noticed in the preceding variety. Immediately back of this is a blackish spot, commonly of a rhombic form and sometimes crossed by a pale line. The base of these wings is somewhat clouded with ash-gray; and near the inner hind angle is a roundish white spot which is sometimes faint and almost effaced. Sometimes a row of small dark brown crescent-shaped spots is perceptible along the apical edge at

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the base of the fringe. The specimens which I have gathered in Washington county have uniformly been of this variety.

The antennæ of these moths are about a third of the length of the wings. They are gray, with a double row of dark brown branches resembling the teeth of a comb. Each branch has a row of very fine hairs, like eye-lashes, along each side, and at its tip three bristles, one of which is much longer and directed inward towards the head. The body is gray, with a small black tuft near the base of the abdomen. The under side is paler and the legs are varied with blackish.

It is the male insects which we have described above. The females are totally different objects, to appearance, being destitute of wings, and having in place of them two small scales the tenth of an inch long and half as broad, situated upon each side of the thorax. The vaporer moth therefore is analagous to the canker worm in this respect, the females in both species resembling worms more than perfect insects. The body of the female vaporer moth is short and thick when it first crawls from the cocoon, and longer and more cylindrical after the eggs have been deposited, being over half an inch long and a third as broad. It is of an ash-gray color from the hairs with which the body is densely covered, and often a broad dusky stripe runs the whole length along the middle of the back. The colors become more dull and obscure after the eggs are deposited. The antennæ in this sex are short and not branched as in the males, merely presenting a row of saw-like teeth along their inner side, each tooth having a short bristle at its apex.

The females merely crawl from the inner to the outer side of their cocoons, and there remain awaiting the approach of their mates, who invariably find them immediately. The instinct of the males for discovering the opposite sex is remarkable; and collectors are accustomed to avail themselves of it for obtaining specimens. By placing a box in which a newly hatched female is enclosed, in the haunts of this species, dozens of males will sometimes be attracted to it. Thus the females commence depositing their eggs often within a few hours after they have left the chrysalis state. The eggs are from one to two hundred in number, about the size of a mustard seed, white and round with a small depression in the summit. They are placed upon the cocoon from which the female came, and are enveloped in a large quantity of frothy, milk-white, viscid matter, causing them to

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adhere securely to the cocoon and to each other. They are extruded in a continuous string, which is folded and matted together so as to form an irregular mass. I once pierced one of these females with a pin while she was in the act of depositing her eggs; and so tenaciously did she adhere to them that for a time it was uncertain whether the body would not tear asunder before it would separate from the string. Within a day or two after she comes out of the cocoon the female has completed her labors. Her body which was at first plump, swollen and unwieldy, is now shrunken and flaccid, and she is so exhausted that she soon lets go her foothold, falls to the ground and perishes. The designs of nature in giving to these insects the habits which they possess are very evident Having no wings by which to escape when menaced with danger, were these worm-like females to crawl about the limbs and trunk of the tree, as the canker worms are accustomed to do, their pale gray bodies would cause them to be discovered and devoured by birds. The canker worm runs no risk of this kind, as it makes its ascent in the winter and early spring when the birds are all absent upon their migration to a warmer climate. The vaporer moth, coming out in August, by remaining stationary upon its light colored cocoon, is but little liable to be noticed. Still, there being even here some risk of its discovery, it hastens to fulfill the purpose of its existence immediately upon coming out of its cocoon, lest some mishap should befall it if it were to remain longer in this exposed situation.

The white frothy matter with which the eggs are covered becomes dry and hard and impervious to wet, thus protecting them through all the storms and vicissitudes of autumn, winter and spring. Nor will a bird be inclined to pick off and devour these eggs with this foam and the hairs of the cocoon adhering to them. They are thus shielded from harm although placed in such an exposed situation, until the return of warm weather brings out a crop of leaves for the subsistence of the worms; whereupon they hatch from the eggs, early in May, and grow up till they become the gay caterpillars which we first noticed above.

But though the vaporer moth is able to guard itself and its progeny from destruction in several directions, it is not thus

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fortunate in other particulars. It is exposed to the attacks of parasites. These are minute bee-like insects pertaining to the Family CHALCIDIDÆ in the Order HYMENOPTERA. They puncture the skin of these pretty caterpillars dropping an egg therein, from which hatches a minute maggot which feeds internally upon the fatty matter of the caterpillar, thus exhausting and eventually killing it. I once gathered two of these caterpillars which I placed with some leaves in a box. Two days afterwards one of them was found to be dead, and the other being lively and vigorous was removed to another box. Next day, what appeared to be the ends of little worms were seen protruding from the body of the dead caterpillar. Upon the following day these worms were found to be seventeen in number. They had all left the dead carcase of the caterpillar and just above it upon the side of the box they had arranged themselves in a circular row, and had changed to pupæ of a milk white color, 0.12 long and half as broad, hanging by their tails with their heads downward and their backs against the side of the box. This was upon the last day of July. Next day they had changed to a pale red color and had somewhat shrivelled, each having discharged a little cluster of clay-yellow grains which were adhering to the side of the box at the tip of their bodies. They subsequently altered to a black color, and on the sixth of August they hatched the winged insects, which were of a brilliant brassy green color, with a blackish purple abdomen and white legs, and about the same size as the pupæ. In an account of the vaporer moth which I published in the Country Gentleman in reply to enquiries respecting it from some of the subscribers of that paper, I named this insect (vol. vii, p. 235) the vaporer-moth parasite (*Trichogramma? Orgyiæ*).

This parasite measures 0.12 to the tip of its abdomen, the wings being slightly longer. The head is brassy green, as broad as the thorax, three or four times as wide as long, and appearing slightly notched in front when viewed from above. The antennæ are brown, the basal joints pale yellow. They are composed of six very distinct joints, of which the first is long and forms an elbow with the following ones. The second joint is smallest; the fourth and fifth are equal, oval, and shorter and thicker than the third; the last is boader than the preceding and longer than the third, and is shaped like an elongated egg. The thorax is brassy-green and finely shagreened, twice as long as wide, broadest across the middle, the collar of a crescent shape and separated by a very distinct suture, the scutel large, pro-

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minent, rounded, tinged with golden-yellow, with an elevated line on each side at its base, extending obliquely forward and outward upon the thorax. The abdomen is purplish-black, very smooth and polished, shorter than the thorax, short cylindrical with rounded ends, depressed above and in the dried specimen deeply excavated and boat-like. Near its base is a pale yellow band occupying the apex of the basal segment above and beneath, and nearly or quite interrupted upon each side. The legs are yellowish-white, including the anterior haunches, the tips of the feet being black. The shanks are without conspicuous spines at their tips, and the feet are composed of four cylindrical, nearly equal joints, each joint having a coarse bristle at its tip on the upper side. The wings are clear and glassy, with numerous minute punctures except upon the basal part, each puncture yielding a fine bristle. A broad glabrous stripe extends along the inner margin of the fore wings, in which is a single row of equidistant punctures and bristles. The fore wings are destitute of veins, except a robust one of a pale color near the outer margin, which unites with the margin through about one-fourth of the length of the wing, separating from it again towards the tip, where it ends in a short branch or stigma which is slightly thickened and notched at its apex.

Another parasitic insect, so much like the preceding in all its details that it might be regarded as its brother reared at the same table, I met with upon rose leaves in September last, where it was very probably searching for these same caterpillars in which to deposit its eggs. In the Country Gentleman this was named

The BROTHER PARASITE, (*Trichogramma? fraterna.*) It is 0.10 in length and its wings when extended are 0.15 across. The thorax is much less rough than in the foregoing species, being very minutely shagreened and the abdomen is of the same brilliant brassy-green color as the thorax, without any pale spot or band towards its base, its under side being black. The sub-marginal vein of the fore-wings is also black, and is united with the margin two-thirds of its length, with the stigmal branch quite short and more conspicuously notched at its end. In all other respects the description given of the preceding species applies to this also.

By these parasites, and probably other means of which we are yet in ignorance, the vaporer moths of our country are crippled and restrained from becoming so numerous as they otherwise would be. In the vicinity of my residence I have never known them to be sufficiently multiplied to merit any attention on account of the depredations they commit. I should judge I had never met with a half dozen of the caterpillars in any one year, until last summer (1855), when they were noticed as being unusually common. This is probably near the northern extreme of their geographical range. In districts farther south and east, where the climate is warmer, they are much more numerous and

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are frequently quite a nuisance. How pernicious they are upon fruit trees, even when their numbers are not excessive, is sufficiently shown in a communication from H. B. Ives, of Salem, Mass., published in Hovey's Magazine, vol. i, p. 52. Mr. Ives removed all the eggs of these insects from three of his apple trees. He found twenty-one clusters of eggs upon these three trees. The rest of the trees in his orchard he left untouched. The eggs hatched and the young worms had commenced their ravages upon the tenth of May. He watched them "from time to time, until many branches had been spoiled of their leaves, and in the autumn were entirely destitute of fruit; while the three trees which had been stripped of the eggs, were flush with foliage, each limb without exception, ripening its fruit." Dr. Harris states (Treatise, p. 283) that these caterpillars were quite abundant in the vicinity of Boston in 1848, '49 and '50; and that the horse-chestnuts planted beside the streets and in the parks of that city—trees which are so little liable to be attacked by insects—were almost entirely stripped of their leaves by them.

Fortunately it is an easy matter to exterminate these insects from the trees which they invade, by picking off and destroying their eggs. These are readily found during the winter, the dead leaf adhering to the cocoon to which the eggs are attached, being conspicuous upon the naked twigs. Sometimes, though very rarely, little clusters of dead leaves will be met with adhering to the limbs of fruit trees, which have not been tied there by the vaporer moth, but by another creature belonging to this division of the animal kingdom. The careful orchardist will hereby, when gathering the eggs of the vaporer moth, be sometimes deceived, and put to the trouble of mounting into a tree and bending a limb towards him, by this impostor; though from the greater number of the leaves, their more dull and decayed appearance, and their being more loosely tied together, making a rattling noise when agitated by the wind or by shaking the limb, the cheat will generally be known at a distance of several feet. These counterfeit clusters of dead leaves originally formed the nest of a Palmer worm (*Chætochilus pometellus*) or some other worm having the same habit of drawing several leaves together

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by cob-web like threads, around the little web within which it dwells. This is evident from the leaves as we see them in winter, being worm-eaten and having the castings of the worm, in the form of dry grains, still adhering to them. But the threads by which such worms tie the leaves together are so slight and fragile, that the leaves forming their nests are all torn off and dispersed by the storms of autumn. In some instances, however, it appears that after the worm has evacuated this abode, another tenant takes possession of it, finding it to be the very situation which he desires for his winter quarters. This new occupant is a small spider, which ties the leaves anew, with threads of its own, numerous threads being woven together, forming a narrow fillet or ribbon which is so strong that although the leaves flutter and rustle with every breeze, they are not torn away by the most violent winds of winter. And within the leaves this spider forms for itself a little oval cot of soft silken threads of snowy whiteness and matted densely together, within which as in a bed of down, it reposes through the winter in comfort and security.

This spider is very closely allied to an Alabama species, named *Epeira displicata*, by Prof. Hentz in his valuable monograph of the spiders of the United States, published in the Boston Journal of Natural History, (vol. v. p. 476.) It however is sufficiently distinguished from that species by wanting the impressed black dots on the anterior part of the abdomen, and by its colors. In allusion to the circumstance which will probably cause this minute object to be most frequently noticed, I propose to name it

The DECEIVING SPIDER (*Epeira decipiens*). As it occurs in its nest in the winter season, this spider is 0.12 long, and of a pale brown color, reddish brown beneath, the head and legs being paler brown or yellowish horn colored, sometimes with a greenish tinge. The abdomen is nearly globular, slightly depressed, and is surrounded horizontally with a whitish band. Posteriorly upon the upper side of this band is a row of six large equidistant black dots, each of which is encircled with a pale yellow ring. Behind the two posterior dots are two very minute ones, which are encircled in the same manner. The spinnerets at the tip of the abdomen are olive green. There are traces of two white cloud-like stripes along the middle of the abdomen, and in a particular reflection of the light it appears to be crossed by imperfect white bands. The legs are furnished with blackish bristles. As in several of the other species of this extensive genus the two upper or posterior eyes are largest and are almost in contact with each other, and the two outer ones upon each side are conflu-

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ent, forming but a single dot, which is slightly elongated. When preserved in balsam of fir this spider retains the black dots and pale rings and band, but the abdomen changes to a bright blood red, and the thorax and legs to a honey yellow color.

In a few other instances dead leaves will be found upon the apple and other trees during the winter; but these are chiefly single leaves at the tip ends of the twigs, which had withered prematurely from being infested with plant lice, and will not be liable to be mistaken for the work of the vaporer moth. One of the most remarkable pieces of mechanism may be met with upon the sycamore or button wood, where the dead leaf is drawn together in such a manner as to form a little wheel, whirling around and sliding up and down upon the last joint of the twig, the bud at the end of the twig forming a knob or button which prevents this wheel from sliding off its axle, and a tube or socket in its centre the fourth of an inch long serves as a hub, preventing it from turning askew. It appears to be an insect, perhaps a species of plant louse, which draws the sycamore leaf around the twig in this truly curious manner.

Care should be taken to rid fruit trees especially from the vaporer moth; for whenever one of these insects takes up its abode upon a tree, a part at least of its progeny will be apt to remain for several generations, sustaining themselves at the expense of the tree. In the winter, or before the foliage puts forth in spring, search should be made for their nests of eggs. They will be much more readily discovered than those of the common caterpillar. Occasionally a cocoon will be met with having no eggs upon it. In this the chrysalis is still lying unhatched, or a male moth has been given out from it. It will be the safest course to strip the trees of all the cocoons found upon them, whether covered with eggs and foam or not, tearing them off from the larger limbs and cutting off the smaller twigs to which they are attached, and throwing the whole into the fire. No one but the veriest sloven will permit his fruit trees to be depredated upon by insects which can be so easily subdued as the vaporer moth.

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A pale yellowish green worm having a dusky or blackish stripe along each side of the back with a narrower whitish stripe on its upper side and a dusky line in the middle, and a shining yellow head, the hue of beeswax; residing in worm-eaten leaves drawn together by silken threads, and when jarred, dropping and hanging in the air suspended by threads; appearing the latter part of June, at times excessively numerous.

The PALMER-WORM, *Chætochilus pometellus*, HARRIS, (Plate 4, fig. 4.)

Though not abundant, this worm is common upon the leaves of orchards and forests, making its appearance every year about the middle of June and continuing till the last of the month. But it sometimes becomes multiplied in a most astonishing manner, appearing suddenly in prodigious numbers over a vast extent of country, in a single day changing the green foliage everywhere to a withered brown hue, as though it had been scorched by fire. And after continuing a week or two it disappears as suddenly as it came, so that on a tree which to-day contains hundreds of these worms, to-morrow not one can be found. And the following year when the same season comes round and we are looking for multitudes of these insects to make their appearance again, no traces of them are to be seen.

As this worm comes forth nearly a month later in the year than the apple tree caterpillar spoken of in the foregoing pages, it is much more destructive to the trees. When their foliage is stripped off and destroyed by this worm, only a slight crop of leaves puts out upon them after it disappears. Old trees and many of the limbs upon young thrifty trees die; and after a visitation of these worms, should the weather during the month of July prove to be dry, and hot, as it frequently is, the damage is much more extensive, whole orchards and forests perishing.

At a former period when the surface of our country was covered with one continuous forest it must have been a singular and sad spectacle to see the timber over such vast districts all blighted and leafless, as it doubtless was at times, from having been overrun by these worms. It is most probably these insects to which the Sweedish naturalist, Kalm, in his travels through this country a century ago, alludes in the following passage, (vol. ii, p. 7.) "There is likewise a kind of caterpillars in these

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provinces, which eat the leaves from the trees. They are innumerable in some years. In the intervals there are but few of them: but when they come, they strip the trees so entirely of their leaves, that the woods in the middle of summer are as naked as in winter. They eat all kinds of leaves, and very few trees are left untouched by them; as, about that time of the year the heat is most excessive. The stripping the trees of their leaves has this fatal consequence, that 'hey cannot withstand the heat, but dry up entirely. In this manner, great forests are sometimes entirely ruined. The Swedes who live here showed me, here and there great tracts in the woods, where young trees were now growing, instead of the old ones, which, some years ago, had been destroyed by the caterpillars. These caterpillars afterwards change into moths, or *phalenæ*."

If our western prairies were ever covered with wood it is most probably by this insect that they were first made naked, those trees only surviving the attack which grew upon the bottom lands along streams, where the drouth of mid-summer would be less felt than upon the uplands.

In the year 1791, the orchards and forests of New England were overrun by this worm, and the leaves of the apple, oak and other trees were devoured by it. It was at this time that it received the name "palmer worm" by which it has since been currently designated. This name was evidently derived from our English translation of the sacred scriptures. Another insect which a month or two before had devastated the fruit trees to an extent never previously known, appears simultaneously to have received the name which it still retains, the canker worm; for previous to this date we find this name given to what is now called the army worm. Many persons at that time, we doubt not, supposed them to be the very insects to which the inspired prophet alluded. Two years before, a clergyman who, from some remarkable phenomena which had just then occurred, had formed the opinion that the arm of the Lord was extended in wrath over our land, had written a discourse, in which it was predicted that great calamities were soon to happen. And the advent at that time of one of these strange insects immediately after the other, in such countless numbers all over the country, 'the palmer worm

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eating what the canker worm had left,' was an event well calculated to make a deep impression upon community, and to strike superstitious and weak-minded persons with awe and terror. The facts here stated we obtain chiefly from Webster on pestilential diseases, vol. i, pp. 286, 293.

Another remarkable visitation of these insects occurred in the year 1853, unparalleled by any event of this kind within the memory of the present generation. It at this time appeared suddenly in excessive numbers, over all the eastern part of the State of New-York, and all the New England States, the newspapers noticing it everywhere from Maine to Connecticut. Although we have no definite information respecting it beyond these limits, it was probably numerous in most parts of our country, several specimens of the moth having been sent me this year from the state of Mississippi, this being the only instance in which I have ever received this insect from any of my correspondents. It was on the sixteenth day of June that it first attracted notice in the section where I reside, but in the southern part of the State it began to be observed about a week earlier. When attention was once directed towards it, it was found to be common in all the orchards and forests around; and within a few days of the date mentioned, its depredations were so conspicuous that in every town and neighborhood thoughout this district of country it was noticed and had become the leading subject of conversation, commonly before they were aware at each locality that every place aronnd them was invaded in the same manner; and the worms were sent to me from different directions by persons who supposed it did not extend beyond the vicinity where they resided. It was currently regarded as a new and unknown insect; and in the prevalent ignorance upon matters of this kind, the most absurd and extravagant conjectures with regard to the origin and transformations of this worm were passed from mouth to mouth, even among educated men and persons of good general intelligence.

As it is probably atmospherical causes or some peculiarity of the seasons which favors the multiplication of this as of other insects, it merits to be observed that the weather had been remarkably dry and hot for some time previous to its advent. And

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according to my own observations, those trees which stood in situations where they were openly exposed to the sun appeared to be most severely devastated, whilst in some instances at least, those standing in the shade of buildings remained green and unharmed; though I was informed of cases in which trees in shaded situations were stripped of their leaves.

The trees everywhere assumed a brown withered appearance, looking as though they had been scorched by fire. Apple trees and oaks seemed to suffer most, but all other trees and shrubs were more or less infested with these worms at this time. On jarring or shaking a tree, hundreds would instantly let themselves down from among the leaves, by fine threads like cobweb, some dropping to the ground, others remaining suspended in the air. Persons at work at this time upon potatoes or other field crops growing in orchards would have numbers of them crawling everywhere over their clothes, and, as an instance of the power of the imagination, the following may be related: A robust laboring man assured me that in three instances in which these worms happened to fall upon his naked arm he felt a stinging sensation like that from the puncture of a mosquito, this being occasioned, as he was firmly persuaded, by their bite. But other persons, with these worms crawling in numberless instances upon their naked skin, experienced nothing of this kind; and subsisting as they do exclusively upon leaves and other succulent vegetation, it is not probable that they employ their jaws upon any substance for which they can have no relish; their natural resort when irritated being not to bite but to wriggle violently and thus throw themselves away from the place where they are molested.

The worms continued in full force until the night of the twenty-third of June, when brisk showers occurred, accompanied with heavy thunder, terminating the drouth which had prevailed, and with this the worms suddenly disappeared. Upon the following day not one could be obtained by shaking trees which had been overrun with them the day before—the rain drops falling upon the leaves having doubtless dislodged them, in the course of the night, and perhaps drowning a considerable portion of them after reaching the ground. With a beating net,

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however, a few specimens could be gathered from the leaves for several days afterwards.

The weather now becoming more moist, with copious showers repeatedly during the month of July, the trees in a measure recovered their leaves, although the crop of fruit for the year was everywhere destroyed. George Christie of East Greenwich informed me that the trees on his farm, in good bearing years produce probably a thousand bushels of apples, and the prospects for an abundant yield were never fairer than they were this year, until this worm made its appearance, blighting the trees and causing the orchard to look as though it had been frost bitten. And he gathered from it this year only two or three bushels of fruit, of a quality so inferior that it was scarcely worth picking. And similar to this was the experience of the owners of orchards generally—young thrifty trees yielding a scanty supply of inferior fruit which commonly sufficed for family use, nothing being gathered from full grown and old trees.

The following year, in June, it was universally expected that these worms would again appear, but the month passed away and no traces of them were anywhere to be seen. They could readily be found, however, on searching upon the leaves of the apple trees, but were no more common than several other kinds of worms in the same situation. Last year, 1855, they were quite rare, a very few specimens only having presented themselves to my notice. The present year they have been much more abundant, and in gardens in the city of Albany I observed a number of fruit trees the leaves of which had been badly eaten by them.

At the time of the appearance of this worm in such myriads in 1853, I was answering a letter from Hon. B. P. Johnson upon another apple tree insect, and inserted therein an account of this worm, with a description of it and the cocoon which it had then formed, stating that I would subsequently complete its history. I suggested that a small gay yellow moth which frequently occurred among apple leaves, a description of which under the name of *Argyrolepia pomariana* I thereto appended, might probably be the parent of these worms. For the information of my immediate neighbors and friends upon a

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topic which was of surpassing interest to them at that time, a copy of this communication was inserted in the Salem Press newspaper of July 12th, copies of which were distributed to all my correspondents. Upon the 8th of July I obtained the insect in its perfect state, and met with specimens in abundance, in orchards and forests upon the following day. A postscript to my previous communication was accordingly prepared, giving a description of the moth, when I was not a little surprised to receive from Dr. Harris a slip from the Cambridge Chronicle of July 19th, containing a short description of this same insect, under the name of *Rhinosia pometella*. Although this name, thus published in a local newspaper, had no scientific validity, I cheerfully adopted it. My communication of June 30th, and a postscript thereto dated July 23d, was published in the Journal of the New-York State Agricultural Society, September 1853, (vol. iv, p. 36), and was re-published with Dr. Harris's article from the Cambridge newspaper appended, in the Society's Transactions for that year, (vol. xiii, pp. 178—192). These are the principal papers upon this insect, so far as I am aware, which have hitherto appeared.

Although from its habit of drawing leaves together in a cluster, secreting itself between and feeding upon them, letting itself down by a thread, &c., the palmer worm corresponds with the Family *Tortricidæ* of the Order LEPIDOPTERA, there is a section of moths of Family TINEIDÆ which possess these same habits, and it is to this latter family which this insect pertains. The genus to which it belongs is characterised principally by having the scales with which the feelers or palpi are clothed very long, jutting forward of the head horizontally like a camel's hair pencil, or a beak, with the last joint slender and projecting upwards from the middle of this beak like a little horn or spur, as represented in the profile view of the head, plate 4, fig. 4 *a*. The name *Chætochilus* given to this genus by Mr. Stephens, is retained by Westwood and Humphrey in their recent work on British moths. The name *Rhinosia* bestowed almost simultaneously upon this genus by the German naturalist Treitschke and adopted by Dr. Harris, is too nearly identical with the name *Rhinotia*, given many years anteriorly by Mr. Kirby to a genus of weevils, to

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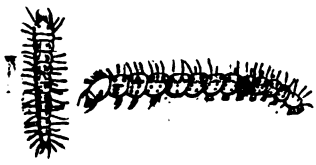
allow its being retained, were it otherwise entitled to stand. *Chætochilus pometellus* thus becomes the scientific name of the palmer worm moth. Dr. Harris proposes "the little Snout moth" as the common name for this insect; but the designation Snout-moth is popularly applied to a very different group of insects, pertaining to the genus *Hypena* in the Family *Pyralidæ*; and the name palmer worm is so well established that no other designation for this species appears to be required or desirable.

When they are young these worms eat only the green pulpy tissues of the leaf, leaving its net work of veins entire. But as they become larger and more robust they consume the whole of the leaf except the coarse veins. It is the young and tender leaves, however, which grow at and near the tips of the limbs, which they prefer; the older and tougher leaves are commonly eaten only at their tip ends, and have irregular holes of various sizes gnawed in them, some of these holes being no larger than a puncture made with a pin. The green succulent ends of the twigs are also frequently ate off. And the young apples which were nearly as large as walnuts when these worms made their appearance, almost without exception had either round holes or larger irregular cavities gnawed in their surface. Thus wounded they wilt and fall from the tree, a few only having the wounds so slight that they recover and remain upon the tree till they ripen.

Both the larvæ or worms, and the moths are much more variable in their colors and irregular in their marks when they are excessively numerous, than they appear to be at other times.



The *larvæ* when small are somewhat tapering, as represented in the first figure of the cut, and pale yellow varied only with a darker stripe along the middle of the back and a darker head. They grow to nearly half an inch in length, and are then more nearly cylindrical, as represented in the second figure. They have sixteen feet, and bodies divided into thirteen segments by transverse constrictions. When approaching to maturity they are commonly of a pale green or yellowish green color, but when these worms are numerous, specimens of a sulphur yellow, watery whitish and flesh red colors will be met with. They are paler or whitish beneath. Along each side of the back a dusky or blackish stripe running the whole length of the body is the most conspicuous and constant mark which they possess. Above this a narrower whitish stripe is more or

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less distinct, and along the middle of the back is a slender dusky stripe between the whitish ones. A transverse line of a clearer white color occupies the hind edge of each segment. Several small black dots symmetrically arranged and each one yielding a fine hair, may be perceived, whereof two above near the hind edge of each segment are the most conspicuous. The head is polished and of the yellow color of bees-wax. The neck or second segment is of the same color, and has above on each side of the middle a black stripe which curves inwards at its hind end, sometimes forming a hook, and outside of this are two black oblong dots, the lower one smaller.

It appears to be the ordinary habit of these worms to remain upon the trees and change to pupæ in the same tuft of leaves in which the larvæ have resided, the worm retiring into a plait or fold of a particular leaf and spinning a slight web of fine silken threads over itself, of so thin a texture that it may be seen through this web. But when they are numerous, multitudes of the worms live openly exposed upon the leaves, and the foliage is so totally destroyed on many trees that it can furnish no safe retreats in which they can conceal themselves when they are ready to change to pupæ. In such cases, as I infer from the habits of the worm when bred in cages, they secrete themselves under dry leaves on the surface of the ground, in crevices of the bark and similar situations, spinning a slight web over themselves. As they remain in the pupa state only a short time they require no regular cocoon or other substantial fabric for their protection.

The pupa is at first of a pale tawny yellow color with the head and sheaths of the wings and legs lighter yellow, and is about a quarter of an inch long. It gradually changes to a darker color, and in about ten or twelve days after the worm ceases feeding and shuts itself up within its web the perfect insect is disclosed. In different years the moths which I have bred have mostly come out of their pupæ state upon the eighth of July; and on one occasion, passing on this day under a large white oak tree which had been entirely stripped of its leaves by these insects, at every step among the weeds and grass a swarm of the moths would arise and flit a yard or two aside and alight again, this fact showing that they were mostly hatched at this date or earlier. The moths are of a gray color and three-eighths of an inch long, and rest with their long narrow wings folded together and laid flat upon their backs, the

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fore part of the body being slightly raised from the surface on which they are standing and the antennæ turned backward and pressed down upon the wings.

The MOTH of the palmer worm (see plate 4, fig. 4) measures about 0.65 across its wings when they are expanded. It is of an ash-gray color. The fore wings are sprinkled more or less with black atoms, and have on the apical edge at the base of the fringe six or seven equidistant black dots. On the disk are also four larger black or brown dots, two before and two behind the middle, the latter nearer together than the former. These dots are placed obliquely with regard to each other, the anterior pair having the outer dot more towards the base of the wing than the inner one, whilst the posterior pair has the inner dot nearer the base than the outer one. Frequently there is a tawny yellow streak or cloud between the anterior dots and the base, situated upon the slight plait or groove formed by the midvein. Sometimes also a dusky transverse band may be discovered on the posterior part of the wing, half way between the posterior dots and the tip. The fringe on the inner tips of these wings is dusky, with a pale tawny band occupying its basal half. The hind wings above and beneath are dusky with a glossy azure blue reflection, and blackish veins, their long fringes being dusky. The under side of the body and the legs are dull whitish with a silky lustre, the feet darker with a white ring at each joint. The antennæ are alternated with rings of black and white.

The VARIETIES of this moth are numerous, particularly in those years when it is abundant. The more important of these are as follows:

a. Ground color of the fore wings dull white instead of ash-gray.
b. Ground color of the fore wings pale tawny yellow.
c. The fore wings with a strong purplish-red reflection.
d. Dots on the middle of the fore wings three only, the anterior one being effaced. Rare. It appears to have been a specimen of this variety from which Dr. Harris's description of the species was taken.
e. The four dots on the middle of the fore wings all wanting.
f. The dots on the apex of the fore wings faint or wanting.

Numbers of these worms are every year destroyed by a small footless grub or maggot, which lives in the palmer worm until it has attained its growth, when it perforates a hole through the side of the worm, and crawling out, spins a small white oval cocoon for itself, commonly attaching this cocoon very slightly to the surface of the leaf. The worm from which this parasite has crawled remains upon the leaf beside it, its feet seemingly paralyzed, so that it is unable to move from the spot. It turns its head at times from one side to the other, but eats no more and soon perishes.

When these worms were present in 1853 some persons attempted to save favorite trees from their ravages by repeatedly jarring the trees and with a pole breaking off the threads by

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which the worms, suspended themselves and carrying them to a distance, repeating the operation day after day. But little benefit, however, appeared to result from this measure. More good may undoubtedly be done by attaching a long stiff handle to an old tin pan, smearing the inside of the pan with tar, bird lime or some similar adhesive substance, and catching the worms in this by swinging it around under the tree, as they hang suspended—renewing the coating as often as it becomes so covered with the worms and their threads as no longer to adhere to them.

The fact of the sudden disappearance of these worms with showers of rain was noticed in several places in the year 1853, and suggests the showering of trees when infested with the palmer worm, with water, by means of a garden engine, as a measure whereby to dislodge and destroy this enemy. At the time of its disappearance in the manner stated, worms of all sizes old and young were upon the leaves, showing it was not in consequence of their having come to maturity and being ready to withdraw, that they left the trees thus abruptly. The fact is reported (Trans. N. Y. State Ag. Soc., vol. xiii, p. 187) that a gentleman having a farm near Albany, discovering that two of the trees in his orchard had their leaves destroyed by these worms, procured some whale oil soap and diluting it with water, drenched the remainder of his trees with it, with a garden engine, whereby they were entirely preserved from the ravages of these worms. The worms were no doubt numerous upon those as they were upon all other trees at that time. Whether the whale oil soap made the application more efficacious than it would have been without it can only be known by further experiments. But the suddenness with which a portion of these worms drop themselves from the leaves of a tree when it is shook or jarred, renders it probable that the greater agitation which showering the leaves, simply, will occasion, will entirely rid them of these vermin.

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A slender pale yellowish worm with a tawny yellow stripe along each side of its back, this stripe having a whitish stripe upon its lower as well as its upper side, and a pale yellow head; residing in the fold of a worm-eaten leaf, the fore part of July.

The TAWNY-STRIPED PALMER-WORM, *Chætochilus Malifoliellus, new species.* A similar worm, but having a shining black head and neck; residing in a similar situation, the latter part of June.

The COMRADE PALMER-WORM (probably), *C. contubernalellus*, FITCH.

In addition to the common Palmer worm, described in the proceeding pages, other worms very similar to it in their appearance, motions and habits, and pertaining to the same genus of moths with it, are occasionally met with upon the leaves of apple trees. One of these I have noticed in different years, the fore part of July, at which time the common Palmer worm has nearly or quite disappeared. It is rather more narrow and slender than that worm but is otherwise like it in form and size. The stripes along each side of its back, however, are of a tawny yellow color, instead of dusky or blackish, and it has a pale stripe along the lower as well as the upper side of this dark stripe. It appears to be even more agile than that species, when disturbed wriggling and throwing itself about with lightning-like velocity.

One of these worms which I met with in an apple leaf which it had folded and tied together with silken threads was placed in a large mouthed vial. Three days afterwards it had eaten the whole of the leaf except its mid-vein, under which and some fine threads which it had spun, it remained concealed. Two fresh leaves were now put into the vial, July 4th. Forsaking its former domicil the worm now took up its abode in one of these leaves, which it folded neatly together, with the edges exactly adjusted to each other and securely sewed in their places. Here entirely hid from view it ate but little more before entering its pupa state, from which the perfect insect was obtained on the twenty-fifth of the same month. The accompanying figure is designed to represent the manner in which these different species of Palmer worms draw the leaves around them, tieing them together with fine silken threads and gnawing them more or less. The pupa also lies within these tufts of worm-eaten leaves, and when ready to disclose

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the winged moth it crowds itself partly out from between them, in which situation the empty shell remains after the moth has evacuated it. At the upper left-hand corner of the figure the relics of the pupa are represented, protruding in this manner from between the leaves.

The LARVA when full grown is half an inch long and about 0.06 in diameter, composed of thirteen segments, distinctly marked by strong wide contractions at each of the sutures. The last segment is divided into two parts by a suture across its middle. The body is slightly flattened and of a pale tawny yellow color above, with two stripes upon the back and one along each side of a white or yellowish white color. Below the lateral white stripe the body on the sides and beneath is pale watery yellowish. Upon the back the edges of the segments are yellowish white, and on the hind part of each, outside of the white dorsal stripes is a polished black dot, from which arises a fine hair. A few other hairs are scattered symmetrically over the surface, arising from small faint dots. The head is flattened, slightly shining and of a paler yellow color than the body, with the antennæ and the tips of the feelers dusky. The neck has five or six dark brown dots each side, irregularly placed and some of them slightly confluent.

The MOTH is very similar to that of the common species, from which it may be distinguished, however, by its fore wings being destitute of any black or darker colored atoms. They are ash-gray and glossy, often with a purplish red reflection, with a row of equidistant black dots on the apical edge at the base of the fringe. Forward of the tips is a dull tawny yellow band margined on its anterior side with dull white. Two dots behind and two forward of the middle, placed as they are in the common species, are also of a dull tawny yellow color margined anteriorly with dull white, sometimes these dots are confluent, forming two short oblique stripes. The expanded wings measure 0.65.

The common Palmer worm is so variable both in the larva and the perfect stages of its life, that I am not without suspicions this may be merely a variety of that species. But as it is later in the season in making its appearance in each instance where I have met with it, and is differently marked in its larva as well as its perfect state, I am induced to regard it as a distinct species.

Associated with the Palmer worms on apple and also on forest trees are found worms which are in all respects like them, except that the head and the upper side of the neck or second segment is black and highly polished, the neck having a slender whitish line on the middle. Though I have not succeeded in breeding any of these it is quite probable they are the progeny of a moth which may occasionally be met with in company with that of the Palmer worm, and which I named *C. contubernalellus*

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or the Comrade in the postscript to my communication on these insects (Trans. N. Y. S. Ag. Soc. vol. xiii, p. 187). This moth is of the same size with that of the Palmer worm and has the same black dots on the middle and apex of the fore wings, but the ground color of these wings is so very dissimilar as to separate it at once from that species.

THE COMRADE of the Palmer worm moth has the fore wings dark brown on their inner sides and their outer half white, often tinged with tawny yellowish, and sprinkled with minute black atoms. When the insect is at rest this white color forms a broad stripe along each side. The inner edge of this stripe is well defined, and the stripe occupies all that part of the wing which is outside of the two outer dots of the four black ones near the middle of the wing, these two dots forming indentations upon its inner edge. Posteriorly the white stripe is gradually narrowed and ends in the fringe slightly forward of the tip; the fringe being black at the tip and yellowish white inside of this, becoming pale dusky towards the inner angle of the wing. On their under sides the fore wings are smoky and the fringe is blackish at the tip and pale dull yellow on each side of this. In all other points this moth is quite similar to that of the palmer worm.

We have several other New-York species pertaining to the genus *Chætochilus*. One of these is occasionally met with the latter part of June in the yards about our houses. It also is of an ash-gray color and has a white band near the tips of its fore wings and three small pale yellowish spots on their outer edge beyond the middle, from which circumstance I propose naming it

The TRIPLE SPOTTED, (*C. trimaculellus*). It measures 0.65 across the wings when spread, is ash-gray and very glossy, the fore wings paler on the inner basal portion, black at their tips and on the outer margin towards their tips, and with a broad blackish streak through the middle, not reaching to the base. The surface of the fore wings is sparsely sprinkled with whitish scales, which forward of the tips become more numerous and condensed, forming an angulated white band, very obvious to the naked eye, shaped like the letter V with its angle towards the tip of the wing. This band ends on the outer margin in a somewhat triangular pale yellow spot, with a smaller spot of the same color beyond it, almost on the tip, and another forward of it, nearly on the middle of the outer edge. The fringe is black, with a row of small whitish spots on its base and larger ones opposite them on the outer edge. The hind wings are sooty, their outer margin broadly whitish except at the tip, and their fringe pale dusky with a band on its middle formed of black spots transversely confluent. The wings on their under sides are dark gray, the anterior pair slightly freckled with whitish and on their outer edge showing the three pale yellow spots which occur above. The body and legs are silvery white, the latter blackish on their outer sides with a white band at each of the joints of the feet. The feelers which project forward of the head are rather short and thick, of a

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gray color marked on their outer side with a broad black stripe which continues backward to the neck and embraces the eye. The spur-like tips of the feelers are white with a black line on the fore side. The spiral tongue when uncoiled is nearly as long as the antennæ, and these reach backward almost two-thirds the length of the wings, and are black alternated with white rings.

I notice this species as it is the only one belonging to the genus which I have captured when in the act of depositing its eggs. It passes these through a long tube or ovipositor which is half the length of the abdomen when extended, and is composed of three cylindrical joints of a pale color, which shut into each other like the joints of a telescope. Its eggs are quite small, oval and opake white, and those of the other species are probably similar.

Another species larger than either of the preceding occurs in woods at the close of autumn, and is remarkable for having both pairs of wings relatively broader and the tips of the anterior ones much more obtuse and cut off obliquely so that the extreme apex forms an obtuse angle instead of an acute one as in the other species; and whilst the other species show no very distinct spots or marks upon their bodies we here upon the under side of the abdomen meet with a broad white stripe having a row of black spots along its middle. It may hence appropriately be named

The BELLY-SPOTTED (*C. ventrellus*). Its expanded wings measure 0.80. It is of an ash gray color with a satin-like lustre, the fore wings varied with paler freckles and sprinkled with numerous black atoms which in places are partially arranged in irregular transverse wavy lines, and on the apical edge is a row of equidistant black dots or short streaks placed on the intervals between the ends of the veins. The fringes and hind wings are pale lead colored or smoky. The abdomen is obscure yellowish, its apex ash-gray, and along each side is a row of glossy whitish spots, one upon the hind edge of each segment. Its under side is smoky, with a very broad white or pale dull yellow stripe along the middle, in which is a row of conspicuous black dots, one upon the hind edge of each segment, and on each side of these dots the edges of the segments have a glossy white reflection forming bands of this color. The wings are paler on their under sides and very glossy, the anterior ones whitish towards their tips and along the hind edge and regularly alternated with dark spots, whereof one is situated on the extreme tip, four others forward of it along the outer or costal edge and four slightly smaller ones upon the apical edge.

Time only can show whether any of these near relatives of the palmer worm which we have now been considering are liable at times to become excessively numerous like that insect, and like an allied species, the cabbage moth, described in my First Report. Should artificial interference to check their depredations become

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necessary, it is probable that the same remedial measures to which allusion has been made under the palmer worm, will be of equal efficacy here. But commonly the numbers of these insects are so limited that they are unable to do any amount of injury which requires attention.

Cylindrical dull yellow worms, with light yellow stripes and black heads, when large becoming black with light yellow stripes and a yellow neck; when alarmed holding both ends of their bodies stiffly upward; clustered closely together and wholly stripping the leaves from one particular limb, in August.

The YELLOW-NECKED APPLE-TREE WORM, or the HANDMAID MOTH, *Eumetopona ministra*, DRURY. (Plate 4, fig. 3.)

There is probably no other insect invading our apple trees which excites more notice and alarm than does this. As it lives together in families, and commencing at the end of a limb, strips it perfectly clean of its leaves, the proprietors of orchards are apprehensive when it makes its appearance that it will continue and multiply until it utterly devastates their trees; and persons have repeatedly brought this worm to me, sometimes coming several miles to enquire its name and whether it is usual for it to remain where it has once made a lodgement. The insect, however, is not very common. Some years a few clusters of these worms will be found scattered upon different trees and then several years will commonly elapse before it is again seen. As these pages are passing through the press it is far more common in the vicinity of my residence than I have ever seen it before. In 1853 it was also to be met with in almost every orchard. And except in these years I have very seldom seen it.

The nakedness of the limb on which these insects are located attracts attention to it, and on coming to look for the cause of this nakedness, a whole family of plump glossy dull yellow or large black worms is found upon one of the branches next below those which have been devastated. If engaged in feeding they are huddled together upon the under surfaces of the leaves, a row of shining black heads, like a string of large beads, appearing along the sides of the leaf, each mouth busily engaged in

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gnawing the margin, which rapidly melts away as they progress in their operations. If at rest they are all crowded together as closely as they can stow themselves, upon the twig where they have last been feeding, clinging to it with their four middle pairs of feet and with the ends of their bodies raised upwards. If the limb be touched or any other alarm is given them they all suddenly throw their tails upward at right angles with the body and curve their heads backward over their backs, with their anterior pairs of feet projecting outwards and resembling little black prickles; and they remain rigidly fixed and motionless in this grotesque posture for several moments and until the apprehended danger has passed away.

The moths begin to make their appearance upon the wing each year as early as the middle of June and continue till the end of July. Each female deposits her whole stock of eggs in a single clustre upon the under side of one of the leaves at the end of a limb. The eggs are from seventy to a hundred in number, white, globular, about three-hundredths of an inch in diameter, placed side by side in nearly straight rows, and securely glued to each other and to the surface of the leaf. The young worm gnaws a large opening through the top of the shell to make its exit. Those eggs which are first laid are hatched about the twentieth of July; others are fully a month later in giving out their broods. Thus some colonies of worms that are almost full grown will be met with when others are small and but a few days old.

The young worms eat only the pulpy under surface of the leaf, leaving its upper surface and veins entire. But when the brood has thus fed upon two or three leaves they acquire sufficient strength to consume the whole substance of the leaf, so that only its stem and a part of the mid-vein is left. The tender succulent leaves growing at the end of the limb where the worms have been placed by their parent, are first devoured; and as the worms advance in size and become more robust, they gradually as they move along down the limb come to leaves which are older and more tough and leathery, such as they would not have been able to feed upon when they were young and small. When the last leaves upon one twig or branch have been consumed, they crawl away to another, to finish their meal. Two or three stragglers

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may be left behind when this migration occurs, being so intently occupied in feeding as not to notice the departure of their comrades. But on becoming aware of their solitary situation they hasten after their associates; and it is curious to observe the unerring accuracy with which they track and find them. On coming to where a twig branches off, it is examined, the worm reaching up it a third of its own length it may be, when it ascertains that the brood is not upon that twig, and drawing back, it travels onward, until it reaches the identical twig up which its predecessors have gone, and up which it at once mounts. The worm would seem to have some instinct by which it is informed of the direction in which its fellows have located themselves, or to possess an acuteness of smell like that for which the dog is noted, to be thus able to scent their footsteps. But when we come to examine the road they have followed, with a magnifying glass, we discover the clue which has doubtlessly served to guide them in this journey. Stretched along upon the bark we find a multitude of threads resembling the finest cobweb, so fine that they are wholly invisible to the eye. These threads the worms spin from their mouths wherever they go. And though so exceedingly slender they possess a surprising degree of strength, it being sufficient to sustain the weight of the worm. Individual worms sometimes when they are disturbed suspend themselves in the air hereby. They are more apt, however, to drop themselves to the ground. Others, when annoyed, throw their heads spitefully from side to side; but their most common resort, as already stated, is to throw the extremities of their bodies upward, and some will even bend themselves so far as to touch their heads and tails together, their bodies thus resembling a hoop or a ring.

The LARVÆ are plump cylindrical shining worms, thinly clothed with long soft white hairs. When young their ground color is tawny yellow or sometimes tawny red; when mature they are coal black. They have been described as gradually changing to a darker color with each change of their skin, but I think this is a mistake. They remain of nearly the same hue from infancy until the last time they change their skins, when they are about an inch and a quarter in length. It is commonly with this change of their skins that they lose their yellow color and become black. When quite young and less than a quarter of

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an inch in length, two black points surrounded by a pale yellow ring are visible above upon each segment, and others upon the sides. From each of these a white hair arises. These dots disappear as the worm becomes larger.

The immature or tawny yellow larvæ have black heads and feet, and a spot on each of the prolegs, another on the tip and the two conical processes on the apex are also black. They have four slender pale or sulphur yellow stripes along each side of the body, and between the two lower of these stripes the breathing pores form a row of black dots, one upon each segment.

The mature or black worm grows to two inches or more in length, and has the same pale yellow markings as the immature worm. The head is black and without any spots. The second segment or neck is of a wax yellow color, and the lower one of the four sulphur yellow stripes on each side of the body is prolonged forward across this segment, with a black stripe contiguous to it on its lower side, and on its upper side a wider black stripe reaches half way across this segment. Above this the next sulphur yellow stripe is prolonged upon the base of this segment and has a short black line upon its upper side. Beneath, this worm has a sulphur yellow stripe along the middle and another upon each side. These lateral stripes are interrupted by a wax yellow spot on the middle of each segment, which spots are larger upon each of the feet-bearing segments and are prolonged inwards, forming transverse bands across the middle of these segments. The six anterior legs are black, the eight prolegs are wax yellow with a black spot upon their outer sides. In place of the pair of prolegs usually occurring at the end of the body this worm has two conical processes, which are abruptly cut off at their tips, and project horizontally backwards. They do not aid the worm in walking, being always elevated from the surface over which it is moving.

These worms are from six to eight weeks or more in growing up to their full size. More than half of them are usually destroyed, mostly, no doubt, by birds, so that of a brood of eighty or a hundred worms which come from the eggs only from twenty to forty are commonly remaining when they approach maturity. It has been reported that the worms of each brood all reach maturity at the same time and evacuate the tree in a single night. But in many broods dwarfish individuals occur, which are scarcely half the size of their fellows, and I have noticed worms which were still engaged in feeding a week or longer after the first ones of their brood had buried themselves.

The pupa state of this insect, which lasts from September to the following June does not appear to have been fully observed, and I regret that I am not able at present to fully complete this important link in its history. If Dr. Harris's observations have been exact, there is some diversity in the habits of these moths at this time. He says they enter the ground to the depth of three or four inches and within twenty-four hours cast their caterpillar

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skins and become chrysalids. But on examining several of these worms which buried themselves about ten days since, I find they are not yet changed to pupæ. They have not inclosed themselves in follicles or formed the slightest cavity in the earth surrounding them. They are lying with their backs upwards, and have become rigid and motionless, and are contracted to half their previous size, now measuring an inch in length and 0.38 in diameter. They are about two inches below the surface, and it is surprising that such thick-bodied, soft and flesh-like worms as these were, were able to penetrate earth which is so firmly compacted that it almost breaks the blade of a knife to open and pry it asunder in clods.

The MOTHS (plate 4, fig. 3) commonly measure from two inches to 2.40 across the wings when spread. The fore wings vary from pale buff yellow to russet and auburn brown. They are crossed by four and sometimes five narrow bands of a rusty or auburn brown color or blackish when the ground color of the wings is dusky, and their surface is more or less sprinkled over with rusty or blackish atoms. The anterior band is transverse and regularly curved like a bent bow, with its concave side towards the base of the wing. The other three bands are parallel with the hind margin. The second, which is commonly slightly broader and more distinct than the others, begins on the middle of the inner margin and runs nearly straight three-fourths of the distance across the wing, when it curves strongly forward to the outer margin. The third band is the most faint and is sometimes wholly wanting. It is parallel with the second and is similarly curved at its outer end though in some individuals less strongly. The fourth band is half way between the third and the tip and is slightly bent like a bow through its whole length, its inner half being nearly parallel with the hind margin and its outer half gradually receding from this margin. A fifth band sometimes occurs, situated slightly forward of this last one and parallel with it. Between the posterior band and the hind margin, commencing on the outer edge of the wing is an oblique rusty brown line, running obliquely inward and forward. Between the first and second bands, outside of the middle of the wing is often a dusky dot and back of it a transverse streak. The fringe of these wings is short and of the same color with the bands, and is edged with whitish on the apex. The hind wings are pale or whitish tinged more or less with tawny yellow or dusky. The hind edge of both pairs is entire and not in the least scalloped or toothed. Beneath they are paler, sometimes dull silvery white, sometimes dusky, at least on the forward pair. The head and fore part of the thorax is bright orange or tawny yellow, this color being deeper or brownish towards its posterior edge. The remainder of the thorax and the abdomen and legs partake of the color of the wings. The tongue or maxillæ is almost the tenth of an inch in length, when extended upward reaching the base of the antennæ, and is spirally coiled. The feelers or palpi are quite small, being only 0.05 long, and are appressed to the under side of the head, occupying the space between

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the oral orifice and the eye. They are clothed with short hair-like scales, their tips being very slightly exposed. The basal joint is obconic, compressed, and curved; the second or middle joint is scarcely as long as the basal and about twice as long as wide, cylindric and compressed; the apical joint is minute, egg-shaped, and but half the diameter of the preceding joints. The antennæ in the males have two rows of short hairs along their inner sides, in the females they are entirely naked and scarcely a third the length of the wings.

The following VARIETIES occur in this species.

a. The third band on the fore wings wanting.

b. A fifth band slightly forward of the hind one, and parallel with it. Common.

c. A brown dot and behind it an oval transverse spot or short line between the the first and second bands. Common.

d. The second and third bands straight and not curved forward towards their outer ends.

e. The whole space between the first and second bands darker than the rest of the wing.

f. The fore wings dark auburn brown, sprinkled with black atoms and the bands black.

This insect was first described and figured in the year 1773, from specimens gathered in New-York by Mr. Drury. He named it *Phalæna ministra*, the Latin word *ministra* meaning a maid-servant or handmaid. This name was perhaps suggested from the plain, modest appearance of this moth, without any diversity of colors or gay ornamental marks such as deck the insects of this order generally. The Handmaid thus becomes the most appropriate common name for this moth, whilst its larva will most readily be distinguished by the name Yellow-necked apple-tree worm. It belongs to the Order LEPIDOPTERA, and it can be referred to no Family of this order except that of NOTODONTIDÆ. The essential mark by which this and the closely allied Family Arctiidæ are distinguished, is, that they possess a minute rudimentary tongue (maxillæ)—the larvæ of the latter family being generally thickly covered with hairs whilst those of the Notodontidæ are nearly or quite naked. The insects of these two groups are thus intermediate between the Bombycidæ in which the tongue is wholly wanting and the other families of this order which have it long and spirally coiled. In none of the genera of the Family Notodontidæ however is the tongue so long as to be coiled, as we find it in the handmaid moth, save one, the genus Lophopteryx. In this genus also, the larva when alarmed throws the ends of its body upwards, in the same manner that our insect does. And in many of its other characters it coincides

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closely with this genus, far more closely than with the genus Pygæra in which it is placed by Dr. Harris, who had probably overlooked the remark made by Mr. Westwood (Drury's Exotic Entomology, vol. ii, p. 28) that from the structure of the larva this insect "is nearly allied to Ptilophora and Petasia, and not to Pygæra." Mr. Westwood accordingly places our insect, though with a query, under the genus Petasia. His specimens of the larva, however, in being wholly denuded of hairs, misled him in one character of some importance, the larvæ of Petasia being destitute of hairs. And not to mention other marks of more or less moment, as from the full descriptions above given these marks will be sufficiently obvious to professed entomologists, who are the only persons that will be interested in this topic, I may observe that in being destitute of any hump or protuberance upon the back of the last segment of the larva, our insect differs from both Petasia and Lophopteryx. Indeed it does not appear to find an exact representative in its preparatory and perfect states, in any European species, and its arrangement, therefore, in any of the genera which have been instituted is palpably incongruous. I am hence obliged to propose a new genus for this insect, which, in allusion to the bright orange or tawny yellow color of its head and the anterior part of the thorax, may be named *Eumetopona* (ευ beautiful, μετωπον front). In a systematic arrangement of this group this genus will stand next to Lophopteryx.

As the works of this insect are 'evil only and that continually,' and as the worms are so easily destroyed by cutting off the twig on which they are clustered and throwing it into the fire, whenever a brood is met with it should be exterminated at once. Hens do not appear to relish them.

Eating irregular notches in the margin and holes in the middle of the leaves, in June and September; a rather thick cylindrical light green worm an inch long with five white lines and numerous white dots.

The APPLE SHOULDER-STRIPED TORTRIX, or the MANY-DOTTED APPLE-LEAF WORM, *Brachytænia Malana*, new species, (plate 8, fig. 5.)

There are many other kinds of worms in addition to those which we have already spoken of, which feed upon the leaves

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of apple trees. But they are seldom noticed, as they are not numerous and do not cluster together in societies, but occur solitary and sparsely scattered among the leaves. One of the most common of these, every year, is a pale green worm of nearly the same hue as the under surface of the leaves, and having numerous pale or white dots and five whitish lines running lengthwise of its body. On beating the leaves of apple trees some of these worms almost always fall into the net. They begin to appear the last of May, and are then small and of a more bright lively green color than when they are full grown. They live openly exposed on the under sides of the leaves, without forming any web or fold in the leaf for their concealment and protection. Though they are more common upon the apple than elsewhere they are not limited to this tree, but occur also on the cherry, the peach, and upon elm, poplar and other forest trees. They reach maturity about the last of June, and then measure an inch and a quarter in length, and 0.20 in diameter. The worm then selects an entire, thrifty leaf and contrives to bend one half of it into a convex form by attaching a fine silken thread which it spins from its mouth, first to the outer edge of the leaf and then to or beyond the middle vein, drawing each successive thread tight, as it fastens its end. It thus gradually curves the leaf until it forms a hollow or cavity of sufficient depth to receive its body under the threads. It then crawls into this cavity and continues to spin its threads, crossing them in every direction, until it has wholly shut itself in beneath the paper-like tissue which it weaves. Thus whilst many insects are put to the labor of spinning a ball or a pod-like cocoon for their protection during their pupa state, this worm has the artifice of bending a leaf so that it forms nearly two thirds of its cocoon, thus greatly abridging the amount of work to be done at this period of its life. Within the cavity thus formed it changes to a chrysalis, from which the perfect insect, which is an ash-gray moth or miller with a few slender black lines marking its fore wings, is subsequently hatched. One of the worms which shut itself within its cocoon on the twenty-fifth of June gave out the moth on the twenty-fifth of July. But I have captured the moths as early as the beginning of July, and worms which have not enclosed themselves in

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their cocoons will also be met with at this date. Hence it appears that some reach maturity and come out in their winged state a month earlier than others.

The moths probably attach their eggs to the leaves, and from them comes another generation of worms the same year. These feed upon the leaves in August and September, and having enclosed themselves in curved leaves in the same manner, are with the fall of the leaves in Autumn carried to the ground, where they lie in their pupa state through the winter and hatch winged moths when the warmth of spring returns. It is quite probable, however, that some moths come from their cocoons late in autumn, and crawling into crevices under the loose bark of trees and similar situations, pass the winter in a torpid state, and come forth again upon the wing early in the spring—for freezing does not kill them, as is shown by the following fact. A worm having inclosed itself in an apple leaf the last of September, the leaf was placed in a tumber of moist earth and was kept in a warm room, whereby the winged moth was disclosed one evening in the latter part of December. The tumbler was hereupon placed out of doors, the night being intensely cold. Next morning the moth within it was found frozen as hard as a stone; but on bringing it within doors, it thawed in a few minutes, and immediately revived, flying and skipping about in perfect health.

The larvæ of this insect will be recognised with ease from what has already been stated respecting them. Worms however which have a most close resemblance to them produce another species of moth. When ready to change to pupæ these bury themselves in the earth and are eventually changed to a larger ash gray moth pertaining to the Family Noctuidæ. The two species are so closely alike when in their larva state that I have supposed they were but one. And I refrain from presenting a description of this larger moth and a full description of the larvæ until more exact observations will enable me to state the marks by which the worms of the one species may be distinguished from those of the other.

The insect whose transformations have been narrated belongs to the Family Tortricidæ and the Order Lepidoptera. It is most intimately related to a European species named *semifasciana*,

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which was formerly placed by Mr. Stephens in the genus Dituba, but in his last work (Catalogue of British Micro-Lepidoptera, p. 25) he makes it the type of a new genus, named Brachytænia, a name meaning short marked or short barred, in allusion to the stripes upon its fore wings. And I propose to designate our insect *Brachytænia Malana*, or the short-barred apple Tortrix, whilst its larva will be most readily distinguished as the Many-dotted apple-tree worm.

This *moth* (see plate 3, fig. 5) measures from 0.80 to 1.15 across its wings when spread. Its fore wings are ash-gray of a rather dark shade, but towards their outer margins ashy-white and sprinkled with a few black atoms. A serpentine black line towards their base extends from their outer nearly or quite to their inner edge, this line being broader and less flexuous near its outer end, and from this end a black streak on the outer edge of the wing reaches to the base, where it meets a black band which runs across the anterior part of the thorax. Parallel with this streak is another interrupted one, placed upon the base of the cubital vein. From the middle of the outer margin a straight black stripe extends obliquely towards the inner angle and ends abruptly near the middle of the wing. Slightly back of this a small triangular black spot is placed on the outer margin; and nearly half way to the tip is a second oblique black stripe, parallel with the first and nearly as long, and from its inner end a very zigzag and serpentine black line runs across to the inner margin. On the hind part of the wing the middle veins are black, commencing at their forks, forming about four slender longitudinal lines. Near the centre of the wing is often a round whitish spot having a black dot in its middle. The hind wings are dull whitish, slightly dusky towards their tips. Both pairs beneath are silvery whitish thickly sprinkled with blackish points towards their outer sides, and on their hind edge is a black line which is slightly interrupted by the tips of each of the veins. The head and thorax are of the same ashy-white color as the outer part of the fore wings. The head has an elevated transverse ridge or crest between the bases of the antennæ and another below this upon the middle of the face, the space between these crests being occupied by a black band. On the hind part of the thorax the scales are also elevated, forming a semicircular crest. The antennæ in the males are pectinated with two rows of short robust branches. Those of the female (fig. 5 *a*) have rows of exceedingly fine short hairs along their insides.

A species which is closely related to the one now described may be found in the forests early in the spring, before the leaves have put forth. It is of an ashy white color with a large three-sided black spot on the middle of the outer margin of the fore wings, from which it may be named

The TRIANGULAR-SPOTTED TORTRIX, *Brachytænia triquetrana*. Its expanded wings measure 0.80. The shoulders or outer bases of the fore wings are occupied by a short broad black stripe, and immediately back of this is a black transverse angular mark, shaped like the letter V, with its inner part more or less interrupted into two or three small spots. The triangular black

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spot back of this on the middle of the outer margin, has its anterior side oblique and its posterior transverse. Beyond this on the outer margin are two or three obscure dusky spots, and the apical portion of the wing faintly shows some wavy transverse clouds and vestiges of a transverse row of black dots.

These worms do not usually occur in such numbers as to render any efforts for their destruction necessary. Should they at any time become so multiplied as to require attention, it is probable that by spreading sheets under the trees and shaking the limbs or beating upon the foliage, most of them may be gathered and destroyed, their thick heavy bodies rendering them so liable to loose their foothold and fall when the leaves are agitated.

AFFECTING THE FRUIT.

Clustering upon and devouring the young apples the latter part of June; also infesting roses, plums, cherries and grape vines:—a smallish buff-yellow beetle, with shining yellow legs and very long black feet.

The Rose-bug, *Macrodactylus subspinosus*, Fabricius. (Plate 2, fig. 3.)

An insect was recently (June, 1856) received from Dr. John Doy, of Lawrence, Kansas, with a statement that it was greatly infesting the young oak trees, and also the grape vines in that vicinity. He also said it appeared to be virulently poisonous. One of his hens with her nine chickens were found dead one morning, and on opening them a quantity of these insects were found in the crops of each. But the surmise that these insects are poisonous is certainly erroneous, though it may be that the poultry in this instance died in consequence of eating them. Dr. Harris in his prize essay upon the insects of this family (Mass. Agric. Repository, vol. x, pp. 1–12), informs us that fowls eat these insects greedily, and that young chickens sometimes suffer severely from swallowing them alive. He adds that a simple remedy in such cases is pouring sweet oil down their throats. It is not improbable, therefore, that full grown hens when rapidly picking up these insects, may sometimes swallow them whole, and that the irritation and wounds which their prickly feet and sharp claws will occasion may prove fatal.

In his report to the Massachusetts legislature in 1838 (House document No. 72, p. 72), Dr. Harris again states that these insects are eaten greedily by domesticated fowls, and the same

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remark is repeated in both the editions of his treatise on injurious insects. This testimony in connection with the known fondness of poultry for other species of insects most closely related to these, led me to speak of fowls as one of the most efficient means for restraining this insect from increasing, in a communication to the Country Gentleman (vol. viii, p. 75). But according to the observations of C. B. Meek, Esq. (Country Gent. vol. viii, p. 106), fowls and birds will not touch these insects. The fact related by Dr. Doy, however, fully confirms the statements of Dr. Harris. The discordant testimony upon this subject may be reconciled by supposing, what is probably the fact, that fowls after having suffered a few times from feeding upon these insects, will afterwards avoid them.

This insect is a beetle which is known by the name of the Rose-bug in different parts of our country. It has doubtless received this name from the fact that it makes its appearance towards the middle of June, about the time that the roses commence flowering, and from the injury which it does them. When these beetles are not excessively numerous it is chiefly upon rose bushes that they are noticed, and they would appear to be most fond of this and other vegetation pertaining to the same natural order, including the apple, the plum and cherry. But when we see the avidity with which they consume the foliage of forest trees also, as well as garden vegetables, grain and grass, we are left in doubt whether they really have any discrimination in their taste. Elder, which from the earliest times has been popularly esteemed as peculiarly repulsive to insects, and sumach, they eat freely. Grape vines suffer severely whenever these insects are numerous. They may frequently be met with upon Indian corn. And they seem to be much attached to a worthless weed which in many of our pastures usurps the place of more valuable herbage, the ox-eye daisy (*Chrysanthemum leucanthemum*). Fond as they are of the wild and the garden rose, still there are some species of this shrub which it is reported that they never molest—the cinnamon rose (*R. cinnamomea*) for instance. And they devour with avidity the fruit as well as the leaves and flowers of the plants which they visit.

It is somewhat remarkable that whilst in many places all over our country this beetle is excessively numerous, in other districts

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it is quite rare or wholly unknown. It is only occasionally that I have found a specimen of it in the vicinity of my own residence, during the past twenty-five years. Some insects brought me from Bethlehem, Pa., while writing these lines, have this species among them, but the collector informs me it is not so common there as to have been noticed as a depredator. Dr. Harris states that it was wholly unknown in Maine and New Hampshire, and in the northern and western parts of Massachusetts, although in and around Boston it was excessively numerous. My correspondents in some parts of Ohio mention it as one of the greatest pests in their neighborhoods. And in Mercer county, Illinois, two years ago, I received surprising statements respecting it. It was the chief and almost the only pernicious insect which had ever been known upon the fruit trees there. The clerk of the county, T. C. Cabeen, Esq., of Keithsburgh, stated to me that in many orchards its numbers could scarcely be credited by persons who had not seen them. It invades the trees when the young apples are about the size of hazelnuts; and so eager is it for this fruit that it gathers upon the apples like bees when swarming, crowding together and clinging one on top of another, forming bunches as large as a tea-cup around a single apple, or the two or three apples which commonly grow from one bud. The fruit is wholly consumed by them, not an apple remaining in the orchard; and when there are not apples enough to satisfy them they eat the leaves of the trees also, more or less. He said he was particularly acquainted with one orchard, which had then for seven years in succession been wholly stripped of fruit by these insects, except two of these years, when the insect from some cause being not quite so numerous, here and there a straggling apple could be discovered upon some of the trees. Mr. James Burnet, residing in the same vicinity, informed me, that whilst these insects are out, a person cannot go into an orchard without their alighting upon his clothes, frequently in such numbers as almost to cover him. Though they do not continue long, their numbers and voracity make ample amends for what they lack in consequence of the shortness of their lives. They devour the young peaches also, though they are less eager for them than for young apples.

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From other sources I was told that when they first show themselves each year, it is chiefly in the fields of spring wheat. They entirely consume the young wheat plants, and then invade the orchards. In consequence of this, many persons are firmly persuaded it is the spring wheat that breeds these beetles; and some have made it a point not to have any spring wheat sowed upon their farms, so long as these insects continue in their neighborhood. But this idea is evidently erroneous. We have a sufficient proof of this, in the fact, that this same insect has for many years been excessively numerous in Eastern Massachusetts, where no wheat, or but a very small quantity, is raised. The known habits of the larva, moreover, show that wheat is by no means essential to it.

This beetle belongs to the Family MELOLONTHIDÆ and the Order COLEOPTERA, the same group which includes a common insect of kindred habits, the May beetle (*Lachnosterna quercina*), which some years is so numerous in particular localities, as to wholly destroy the fruit when in its germ. One of the insects most common in Europe and most often mentioned in books, the cockchaffer, also belongs to this group; and Dr. Harris states that it would be more correct to call the species under consideration the rose-chaffer, instead of rose-bug. But this would lead to confusion, as another insect (*Cetonia aurata*), is commonly called the rose-chaffer. Rose-beetle would be the most appropriate name by which to designate it, the term "bug" in strictness belonging only to insects of the Order Hemiptera, although in this country it is universally current for Coleopterous insects also; and the proper term for the latter insects, "beetle," is never heard among us, except occasionally from a person who has learned it from books. This insect, however, has become so widely known by the name rose-bug, that it is useless to attempt changing this name.

Its scientific name is *Macrodactylus subspinosus*. The generic name Macrodactylus, i. e. great claws or great feet, was bestowed upon it by the eminent French entomologist Latreille, in consequence of the remarkable length of its feet. Nearly a dozen other insects are now known which rank in this genus, all of them natives of Brazil or of Mexico. Its specific name *subspin-*

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ous, meaning slightly or somewhat spined, has allusion to the sides of the thorax which jut out into an obtuse angle merely, many beetles closely related to this having sharp pointed spines or teeth where this angle occurs. In Dr. F. E. Melsheimer's Catalogue of Coleoptera, lately published, Linnæus is cited as having originally given this name to this species, but on what authority it is credited to him does not appear. Dr. Harris says this insect was first named and described by Fabricius in 1781; but this author had previously described it (Syst. Entom. p. 39) in the year 1775; and this appears to be the first notice of it on record. Herbst subsequently described it under the name *elongata* and Beauvois under that of *angustata*, both these names having allusion to its long, narrow form.

The Rose-bug is 0.35 long or a little less. (The figure, plate 2, fig. 3 is intended to represent it its natural size.) It is covered with minute scales which give it a buff or ochre yellow color above, the head and thorax being of a lighter yellow tint, and the under side of the body is white. If these scales are rubbed off, the head, thorax and under side of the body is black and the wing covers yellowish brown. The antennæ are bright tawny yellow, their tips black. When extended backward they reach the middle of the thorax. They are composed of nine joints (as shown, magnified, plate 2, fig. 3 *a*), the three last being long, flattened and shutting together like the leaves of a book, and forming a large oval knob. The mouth and feelers are tawny yellowish-red often tinged more or less with black. The thorax is longer than wide, narrower than the wing covers, broadest across its middle, where on each side it bulges outwards forming almost an angular protuberance, from whence it is strongly narrowed both before and behind, making it nearly six-sided. The scutel between the base of the wing covers is rounded at its tip and almost semicircular, being rather longer than broad. The wing covers have slightly elevated ridges lengthwise. The whole of the last segment of the abdomen is exposed beyond their tips and is inclined obliquely downwards. The legs are bright tawny yellow, the four hind shanks are black at their tips and armed with a pair of thorn-like spines. The feet are alike in both sexes; each joint is narrower towards its base and of a tawny yellow color, black at its tip and furnished with a crown of black spines and bristles. The feet end in two strong claws or hooks of equal size, the tips of which are split.

This species presents several varieties, the scales being sometimes grayish-white above instead of yellow, the thorax beneath the scales brownish-red, &c.

The rose-bug first strongly excited public attention, in Massachusetts, in the year 1825, and the accounts of the extensive devastation which it was producing in various parts of the State induced the Massachusetts Agricultural Society to offer a premium for an essay upon its natural history, and some probable means for checking its progress. No such essay being presented

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within the time specified, one of the active managers of the society, John Lowell Esq., the following year drew up an interesting statement of the facts in its history which had fallen under his observation, which was published in the Massachusetts Agric. Repository, vol. ix, p. 143. In the succeeding volume of the same publication appeared, in July 1827, Dr. Harris's essay already referred to, entitled "Minutes towards a history of some American species of Melolonthidæ particularly injurious to vegetation," to which the prize which had previously been offered was awarded. And shortly afterwards a communication from Dr. Green appeared in the New England Farmer (vol. vi, p. 41 &c.) giving additional information respecting this insect. These are the principal articles upon the rose-bug which have hitherto been published; and from them we learn that its history and transformations are as follows.

The insects make their appearance suddenly, in incredible numbers. Esq. Lowell states that in 1826 not a rose-bug was visible on the last day of May. On the first of June at eight o'clock in the morning he gathered a mess of peas, and not a bug was then to be seen on the vines. At 10 o'clock happening to visit the vines again, they were literally overrun with rose-bugs of both sexes, generally paired or double. He proceeded to kill them by hand. Three hours afterwards they had appeared upon some rows of bush beans to the number of some thousands. These were all killed, and then on returning to the peas to see if any there had been overlooked, he found the vines as full as before. The next day he found them upon his corn, then only six inches high, twenty-five bugs being counted upon a single leaf, and one hundred and five on one of the hills. They also attacked his young cherry trees, and in twelve hours completely stripped them of their leaves. He says it would be but a moderate computation to allow that they killed a hundred thousand of these insects on a quarter of an acre. They followed them up regularly every morning, for a week, and thus nearly subdued them upon that piece of ground.

They continue about a month, and then all disappear. Towards the close of their lives the females crawl an inch or more

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into the ground, where they deposit their eggs, which are about thirty in number, whitish, and almost globular. These hatch twenty days afterwards, and the little grubs which come from them, feed upon whatever tender, juicy roots they find. They grow to their full size before winter, and are then three-quarters of an inch long, and an eighth broad, of a yellowish white color, the head darker, tawny yellow and polished, and with six short legs inserted beneath upon the breast. The last segment of their bodies is much the largest, bluntly rounded at its end, and is turned under the body. To pass the winter these grubs descend in the ground below the reach of frost, and become torpid. When warm weather returns they revive and crawl back towards the surface, and each worm then forms for itself a pod-like cell of a regular oval form, and smooth on its inside. This is made by the worm turning round and round in one spot, whereby the dirt surrounding it becomes firmly compacted together. In this cell it changes to a pupa, which is soft and of the same color as the worm, but in shape resembles the beetle, the short wings and the horns and legs being traced out upon its surface, enveloped in a thin film, which, when the beetle becomes matured, is cast off. It then breaks open the earthy pod and digs through the ground till it reaches the surface. On its first coming out it is found upon the oak and elm before it invades either the wild or the garden rose.

These beetles have several natural enemies. The large dragon-fly or darning needles, and several other predaceous insects, seize and devour numbers of them, whilst the insect-eating birds as well as dung-hill fowls have been said to feast and fatten upon them. But when they become so excessively multiplied as they do in particular districts, these natural enemies are unable to produce any material diminution in the myriads which are abroad, and it becomes necessary to resort to artificial means for destroying them. The only reliable measure for this purpose, yet known, is to gather them day after day by hand, or by brushing them into tin vessels of water, and by shaking and beating them from trees into sheets spread underneath, and then crushing, burning, or scalding them. This beetle is easily captured, being sluggish and drone-like in its motions, and a

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person who enters resolutely upon this work will destroy countless numbers every hour. But it requires the combined efforts of a multitude of persons, when a district is overrun, to rid it of this pest; and bounties from the public treasury to encourage the destruction of such vermin, might as appropriately be paid, as for the destruction of wolves and other animals which are a public nuisance.

I have only further to remark that where these insects have abounded, grapes and other choice fruits, which it was earnestly desired to save from destruction, have been effectually protected, by covering the vines and shrubs with millinet or some other similar netting.

In the interior of ripened and stored apples accelerating their decay, whilst the outside remains fair; numerous slender tapering glassy-white worms.

The APPLE MIDGE, *Molobrus Mali*, new species.

The common apple worm or larva of the codling moth (*Carpocapsa Pomonella*,) a soft flesh-colored or white worm with a shining tawny yellow head, which feeds upon the seeds and adjacent fleshy parts of the apple and perforates a hole in its side through which to make its escape when ready to become a pupa, is the only insect which has been as yet noticed in our country as residing within this fruit. But from having observed apples the cores of which appeared to be depredated upon in a different manner from that of this worm, I have long entertained the opinion that we have other insects also which spoil this fruit from feeding internally upon it. And I have recently met with one insect of this kind, my investigations of which I here present.

Among the apples exhibited at the annual meeting of the State Agricultural Society, February 1856, I noticed one perforated with a hole from which a worm of the codling moth had made its exit. I took this apple at the close of the exhibition and examined it next day. It was a fine large specimen, fair externally and without any blemish except the perforation already mentioned. But on cutting it open almost the whole of its interior was found to be decayed. Its fleshy part was mostly

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changed to a dull yellowish spongy substance resembling dried apple, with deep fissures or sinuses running through it. The seeds were blackened but entire and perfect, one only being worm eaten. In the centre was a large irregular cavity or vacant space, the sides of which were wet and slimy, and with numerous black grains, the castings of the worms which had occupied this cavity. And adhering to this slimy matter were found two pupæ of a small fly or midge, with numerous empty shells or skins of other pupæ from which the flies had hatched. And the remains of some of these flies were also present, having perished from their wings becoming entangled in this slimy matter. But they had mostly disappeared, the hole perforated by the codling worm giving them a passage way out to the external air. And it hence appears probable that it is those apples only, which are thus perforated, which are resorted to by these insects, as the passage which may be seen leading from the flower end into this cavity is scarcely of sufficient size to give them an exit after they have completed their transformations.

A fly was also discovered, which had that moment left its pupa shell, its wings being then undeveloped and only a third the length of its body. But in less than half a minute they had expanded to a length equalling that of the body, in which state they remained, the dry atmosphere let into the apple by cutting it asunder rendering them rigid and incapable of expanding to their full size. This fact beautifully illustrates how extremely delicate the wings of these flies are, requiring the damp atmosphere which they find in the interior of the apple to keep them soft and pliant until they become fully developed; and if a breath of dry air passes over them at this time, it dries them prematurely and they thenceforth remain deformed.

Whether the parent fly places her eggs upon the flower end of the apple and the young worms mine their way from thence into its center, or whether she attacks those apples only which the codling worm has left, crawling into the fruit through the perforation in the side which this worm has made, future researches must determine. The latter, however, appears to be the most probable. And this insect would hence appear to merely continue the mischief which the codling moth has commenced. The

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larvæ of insects of this kind are long slender footless worms, tapering gradually to a point at the head, the opposite end being blunt. They are of a shining glassy white color, the viscera and alimentary matter contained therein showing more or less distinctly through their semi-transparent skins. They are more than double the length of the pupæ.

The *Pupa* of this species is 0.12 long, though slightly variable in its dimensions. It is not enclosed in a cocoon, and its surface is somewhat glutinous, causing particles of dirt to adhere to it. It is of an elongated ovate form, pointed at one end and rounded at the other. Its head, thorax and wing and leg cases are black, the abdomen dull pale yellow, some specimens showing a short broad pale dusky band upon the back, on each segment, and some have a faint dusky stripe on the opposite side, from the leg cases to the tip. The thorax has the same color as the abdomen. The region of the throat is dull yellowish, more or less tinged with dusky.

The flies when at rest and with their wings folded and laid flat upon their backs have a close resemblance to the Hessian fly in every respect except that their legs are not so long and slender. And they pertain to the same group of insects with that, in the Family TIPULIDÆ and Order DIPTERA. They belong, however, to a different genus, named *Molobrus* by Latreille, which may be recognized by its having five longitudinal veins in its wings, the middle one of which is forked. And the present species, which appears to be different from those which have hitherto been described. may be named

The APPLE MIDGE, *Molobrus Mali*. It measures 0.15 in length to the tips of its wings. The head is black, spheroidal, transverse. The thorax is black and smooth, the scutel separated from it by a deep wide fissure. The abdomen is dusky, almost black, with a bright yellow band at each of the sutures; beneath it is yellow with the middle of each segment occupied by a large square dusky spot; its tip is black, as is also the ovipositor, which is inclined downward and is composed of two pubescent linear valves. The legs are about as long as the body and are black as are the antennæ also, though of a less deep tint than the head and thorax. The poisers are dusky. The wings are dull hyaline tinged with smoky, and are a fourth longer than the abdomen. In the female the antennæ are half the length of the body and composed of fifteen short cylindric joints half as broad as long, clothed with short bristles which incline towards the tip, the joints very slightly diminishing in diameter outwards and but slightly separated from each other. The two basal joints are thicker and shorter than the following ones, as broad as long, and compacted together, the second and third joints being most widely separated from each other.

The flies belonging to this genus are all small, like the one we have described, and of black or blackish colors. Most of the larvæ which have been noticed have been found in the roots of

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decaying trees, beneath the bark. The genus is somewhat extensive, nearly thirty species occurring in Great Britain alone, and they appear to be equally common upon this side of the Atlantic. Three of our species have been described by Mr. Say, and several others are in my own collection. Our most common species occurs from the last of June till the middle of August, in woods and in the yards about our buildings, and may frequently be met with upon the windows in our houses. It may be named

The COMMON MIDGE, *Molobrus vulgaris*. It measures 0.10 to 0.12 in length, and is black, with blackish brown legs and pale thighs. Its poisers are whitish, and its wings hyaline. The sides of its thorax below the wings are tinged with pale, and the abdomen with brown, rarely pale.

Another common species found in the same situations and at the same dates with the preceding, and quite similar to it in its colors, may be distinguished from it by its much larger size and the smokiness of its wings.

THE SMOKY-WINGED MIDGE, *Molobrus fuliginosus*, measures 0.18 in length, and is black with blackish brown shanks and pale thighs, their haunches being commonly white. Its wings are semi-transparent and smoky. The sixteen cylindrical joints of its antennæ are more widely separated from each other by short intervening pedicles than in the preceding species. The gravid female, when pinned, extrudes her eggs, connected together in a continuous string.

A smaller species than either of the preceding, attracted my notice from the singular manner in which it ran about upon the paper on which I was writing, one night the latter part of December. As other individuals were found at the same period upon the windows, there is little doubt they had hatched from the earth in some flower pots which were in the room. This tiny insect would advance very rapidly two or three inches and then abruptly pause or move backwards a step or two and instantly run again in another direction about the same distance, and then back up again and start off in another course. It is quite similar to the *Molobrus* (*Sciara*) *femoratus* of Mr. Say, which like the foregoing, is a common species on windows in the month of July, but here the abdomen is of a uniform color, or pale only at its tip. It may be named in allusion to its mode of running,

The FICKLE MIDGE, *Molobrus inconstans*. It measures 0.08 in length, and is black with the thorax smooth and slightly shining, the thighs pale and whitish, and the wings pellucid and glassy with an iridescent violet and red reflection.

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INFESTING FOREST TREES.

1. THE PINE.

AFFECTING THE LEAVES.

Fixed upon the sides of the leaves, exhausting them of their juices; small oblong flattish white scales, with a pale yellow spot upon their pointed end.

The PINE-LEAF SCALE-INSECT, *Aspidiotus Pinifoliæ*, new species.

In those sections of our country where it is not common as a native of the forests there is scarcely any tree which is more esteemed for ornamenting the grounds around a dwelling than the white pine. Especially is it a favorite, and strenuous attempts are making to cultivate it about houses upon the prairies of the west; its tall growth and perennial foliage adapting it so well for a shelter from the winds of winter which sweep over those vast plains with such piercing severity; whilst by many of the residents there it is further prized as having been associated with the scenes of their early life, and thus reviving pleasant remembrances of their childhood's home.

But when it is transplanted the pine appears to be much more subject to the attacks of insects than when it is growing spontaneously. At least we meet with some kinds of these depredators upon cultivated pines, which we have never been able to discover upon these trees when growing wild in our forests. One of these, a species of coccus infesting the bark, and named the pine blight, was described in my First Report. We come now to treat of another insect of the same Family COCCIDÆ, which fixes itself upon the leaves, exhausting them of their juices and thus causing them to perish and fall, and the ends of the limbs to die when thus defoliated. Specimens of the leaves, thronged with these insects, were sent me by Robert W. Kennicott, of West North-

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Fig 1. Hop-vine Hyperia
" 2. Elegant "
" 3. Deceptive wheat fly
Fig 4 Common wheat fly
" 5 Shard headed wheat fly

Lith. of C. Van Benthuysen.

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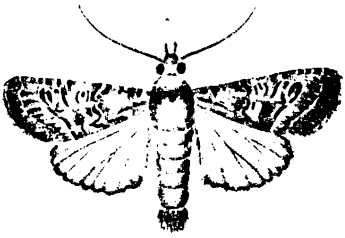

Lith of C Van Beethuysen.

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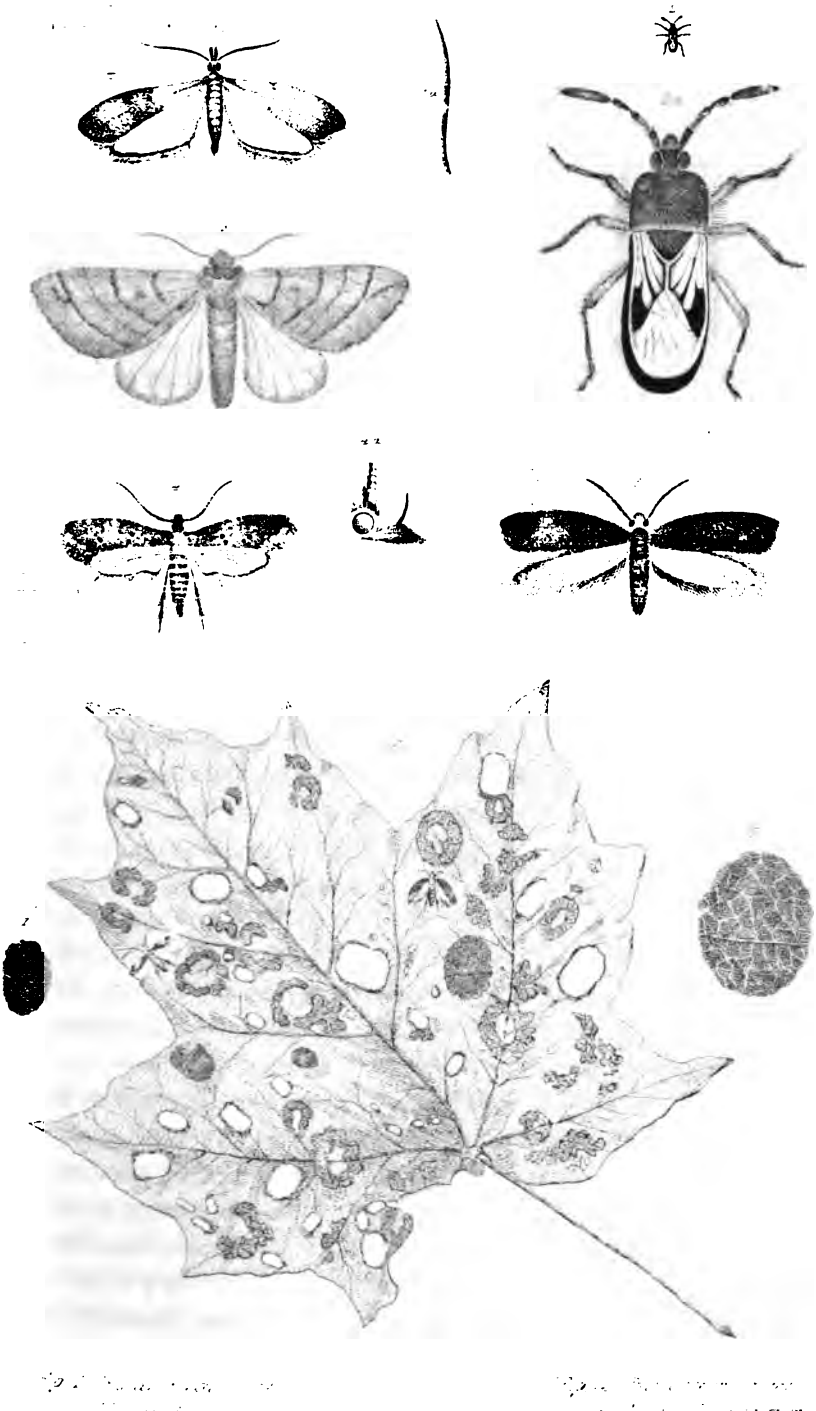

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field, Cook county, Illinois, who gathered them the fore part of September, from pines in the yard of S. Francis, Esq., in the city of Springfield, in that State. These insects pertain to the genus *Aspidiotus*. No species of this genus has hitherto been discovered, infesting any tree of the pine or fir family. I infer this to be different, therefore, from anything which has been as yet described, and accordingly name it the Pine-leaf scale-insect, *Aspidiotus Pinifoliæ*. In size and shape these scales bear a marked resemblance to those of the Apple bark-louse (*A. conchiformis*) described in my last year's report, except that they are not curved as those are. Thus their form is like that of a muscle shell (*Mytilus*) rather than that of an oyster. Their color moreover, distinguishes them from any of the other kinds of scale-insects which are known to me, it being pure white, with a small pale yellow spot upon the pointed end, which spot is readily discerned by the naked eye.

The leaves of the pine are three-sided or shaped like a prism, and it is along one of the sides of these leaves that the scales are mostly placed, a few scattering ones, however, frequently being stationed on one of the other sides. In the specimens sent me they are crowded as closely as they can stow themselves, and frequently one scale overlaps the end of the next one. They are arranged lengthwise in a row, extending the whole length of the leaf, their width being just equal to that of the leaf. The small end in some is towards the base, in others towards the apex of the leaf.

When examined with a magnifier, those scales which are fully grown appear externally to be composed of three distinct scales, representing seemingly the head, thorax and abdomen of the living insect—each being of an oval form with rounded ends, and overlapping each other like the tiles of a roof. The largest of these three segments is of a pure white color, and of a somewhat waxy lustre, resembling in its appearance a small oblong drop of spermaceti tallow. Numerous parallel curved lines are sometimes perceptible across its surface. Overlapping the end of this is a pale dull yellow scale, a third or fourth of its size, and having a raised line along its middle. To this succeeds

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another, half the size of the preceding, this third segment being subhyaline, yellowish, and obtusely striated transversely. Beneath, this scale is white its whole length, without any indications of those divisions which appear upon its upper side. It is the tenth of an inch in length. Specimens but half grown are interspersed with the others, and all the scales on some of the leaves are of this small size. These show a raised line or slightly elevated keel along the middle of the white portion. Other specimens still, are merely minute oval dull yellow scales, without any whiteness at the end.

The scales which we have now described are the relics of the dead bodies of the female insects, forming a shield for covering and protecting their eggs. At the time the specimens before me were gathered the eggs had not become developed. Consequently on elevating one and another of these scales with the point of a needle, nothing is found beneath them except a small shapeless mass of dried black matter, the remains of the viscera of the insect. But at any time during the winter season, the little cavity under these scales will undoubtedly be found filled with minute round eggs. And the transformations of this species will be similar to those narrated of the Apple bark-louse.

It is evident that an insect of the pernicious character of the one under consideration, when so abundant as this appears to have been upon the pines from which the specimens before me were gathered, would soon cause the leaves to perish and the trees to die, if permitted to proceed unchecked in its career. But, fortunately, nature has in this as in most other analogous instances, provided means for restraining these creatures from becoming unduly numerous. A minute worm which feeds upon the eggs of the Apple bark-louse was noticed in our account of that species. Another insect, a species of Lady-bird, or Coccinella, common throughout the United States, devours both the Apple bark-lice and those of this species. I have repeatedly met with this Coccinella upon apple trees, but had not ascertained which particular kind of vermin it was in pursuit of upon those trees. For authentic information upon this interesting topic we are indebted to Mr. Kennicott, who has observed the larvæ of this lady-bird preying with tiger-like ferocity upon the Apple

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bark-lice, and who met with the same larvæ and also the pupæ and perfect insects upon the pines on which the scale-insects of which we are speaking occurred. Specimens of the insects and their pupæ which he sent me, enable me to present an account of the preparatory states of this species. The habits of the group of insects to which this belongs, were narrated in my last report. The lice upon which this species feeds are so exceedingly minute that a large number of them will no more than suffice it for a single meal; and therefore, in the course of its life, each individual probably slaughters and devours such a multitude as can scarcely be computed. They thus render us a service of great value, and it is to be hoped that no one will fall into the enormous mistake of supposing that these lady-birds breed the lice among which they are found, and therefore undertake to exterminate them, as was once done where a similar species occurred upon currant bushes, as related in my last report.

In allusion to its habits this species may be named the Bark-louse lady-bird. It pertains to the genus *Chilocorus* of the Family COCCINELLIDÆ and Order COLEOPTERA. It was noticed more than a century ago, by the Swedish naturalist, Kalm, when traveling through this country, who supposed it to be identical with the European *C. bipustulata*. It was afterwards for a long time confounded with the *C. Cacti*, Linn., a Mexican species closely related to it, which feeds upon the Cochineal insect (*Coccus Cacti.*) We accordingly find it entered under this name in Dr. Harris's Catalogue of the Insects of Massachusetts. Mr. Say corrected this error in an article in the Boston Journal of Nat. Hist. (vol. i, p. 202) published in 1835, in which he thus speaks of this subject:—"*C. Cacti* Fabr. This species occurs abundantly in Mexico; it certainly resembles very closely the *stigma*, Nobis, so common in this country, and the *renipustulata*, Mull. of Europe; but it is more than twice the size of either of those insects, and may also be distinguished from the former by the superior magnitude of the rufous spot of which the form is transversely oval, whilst that of the *stigma* is orbiculor." Two years after this, this same species was named *bivulnerus* in the third edition of Dejean's Catalogue, and in 1851 Mulsant (Coleopt. Trimer. Securip. p. 460) published a description of it under this latter name,

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which is also the name under which it is entered in Dr. Melsheimer's Catalogue (p. 130) published by the Smithsonian Institution. Although the name *stigma* is but incidentally given by Mr. Say in the extract above quoted, it still is a published name, accompanied with such a description as makes it perfectly clear to what species this name is applied. This is all that is requisite, in my view, to establish Mr. Say's claim in the premises. In how many instances have authors bestowed names accompanied with no other description than a mere statement of one or two points in which the species designated differed from another known species. I consequently regard the correct scientific designation of this insect to be *Chilocorus stigma*.

The larvæ are of a dull white color, with black shining heads, black legs and six rows of long black thorn-like spines running the whole length of the body, one spine of each of the rows arising from each segment. The spines are branched, sending off numerous small slender sharp points on every side. Covered thus formidably with prickles, it is probable that these little alligator-like animals are never devoured by birds, and are able to pursue their useful labors incessantly and without molestation from enemies.

At almost every step when studying this department of the works of nature, we are meeting with phenomena which excite our astonishment and admiration. These lady-birds are destined to remain dormant and motionless in their pupa state, for a period of about two weeks, in the middle of summer, when all nature around them is full of life and activity. We should expect they would at this time select some obscure retreat where they would not be apt to be noticed and devoured by birds or annoyed by any other creature. We have already observed that the leaves of the pine which are infested by the scale insect perish and fall, and that the twigs thus denuded become withered and dry. We should suppose that these dead leafless twigs, where it will be so conspicuously exposed, would be especially avoided by the lady-bird when seeking a place to repose during its pupa state. But, to our surprise, we find these insects at this time all crowding together upon the ends of these naked twigs. And they here fix themselves by their tails, and become motion-

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less pupæ, retaining around them the prickly skins of their larva state. The appearance which they now present is truly remarkable, the twig thus covered bearing the most perfect resemblance to a stem covered with burrs or thorny seeds, like the ripened spikes of the hound's tongue (*Cynoglossum officinale*) or some more prickly plant. No bird will be disposed to approach anything having such a *noli-me-tangere* aspect. And how curious it is that the scale insect by killing the leaves and making the twigs bare should be adapting them for the abode of its mortal foe. With such a discriminating eye has the Author of nature planned the economy of these useful little creatures, making it on the one hand their especial work to destroy a pernicious family of insects, and on the other hand shielding them from being destroyed in their turn. They would thus appear to be under the special protection of Providence, and it is remarkable that long ago, in a superstitious age, and when the habits of this tribe of insects could have been but vaguely if at all known, they were regarded in this same light, and in different countries, and are supposed to have thus obtained in France the name of "God's cows" and "The Virgin's cattle" and in England "Our Lady's birds," and children were incited to regard them with kindness and leave them at liberty, by chanting to them to "fly away home, your house is on fire, your children will burn."

In this family, as stated in my last Report, the pupæ remain partly enveloped in the prickly skin of the larvæ. In some species, however, the larva skin is thrown entirely off, as I stated it to be in the fifteen spotted or apple-tree lady-bird, and I observe Mr. Westwood (Introduction, vol. i, p. 396) describes the *C. bipustulata* as throwing off its skin in the same manner. In the species now under consideration, the pupa appears from the empty skins to be almost entirely enveloped in the skin of the larva, with the rows of spines and their prickles protecting it in every direction, and the head and legs of the larva retaining their natural form, the latter being on the side towards the twig from which the pupa is suspended. The empty pupa skin is glassy and of a dull yellow color with blackish clouds. It remains partly protruded from the lower or anterior part of the cleft in the back of the larva skin.

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In its perfect state the Bark-louse lady-bird is 0.17 or 0.20 long, very convex and almost hemispheric, highly polished and shining, covered with numerous very minute punctures. It is black with a round red or reddish yellow spot on the middle of each wing cover. Beneath it is black with the abdomen red or yellow, its basal segment black except upon each side.

It is probable that the scale insect of the pine can be destroyed by thoroughly showering the leaves with a solution of soap or with tobacco water immediately after the young larvæ have hatched from the eggs. Could we be so fortunate as to devise some mode by which we could multiply the lady-bird at pleasure, it would undoubtedly be the most effectual mode of ridding the pine and also the apple tree of these minute vermin which are so pernicious to them.

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2. THE LARCH OR TAMARACK.

AFFECTING THE LEAVES.

On the limbs in June and July, consuming the leaves; a large flattened ash-gray worm, resting appressed to and closely resembling the bark. The LARCH CHEATER OR LAPPET MOTH, *Planosa Laricis*, (plate 2, fig. 5, 6,) new species.

The modes by which nature has endowed many insects to enable them to elude the search of birds and other enemies are often truly wonderful. Among the insects thus endowed, the lappet moths and their caterpillars have often excited the admiration of the curious. The latter when in repose have the body flattened, somewhat like that of a leech, and on each side of each segment projects a little lappet or flat lobe. These lappets are pressed down upon the surface of the limb on which the worm is at rest. The sides of the body are also fringed with hairs which are similarly appressed to the limb. Thus all appearance of an abrupt elevation or an interstice to indicate the ends and sides of the worm is obliterated, and it resembles merely a slight swell of the natural bark, the deception being made complete by the color, which is commonly identical in its hue with that of the bark. And when there are spots or marks upon the caterpillar, they imitate the glandular dots, scars and

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other discolorations which will be seen upon the bark around it. Even upon the closest scrutiny the eye fails to detect anything by which we can be assured this slight elevation is not a tumor which has grown in the bark. A lady to whom I once pointed out one of these caterpillars, I could perceive distrusted my statement and supposed I was imposing upon her credulity, the slight inequality at the point indicated being so exactly like a natural tumor upon the bark and so totally unlike a living worm. But a mite, wandering over the limb, on coming to this elevated spot sought to crawl under it, whereupon it gave a convulsive shrug to frighten the intruder away, by which the lady's skepticism was dispelled. The cocoons which they construct upon the limbs are equally exact counterfeits of the bush. One of these upon a limb of the wild black cherry is now in the museum of the State Agricultural Society. It is placed longitudinally in the slight angle formed exteriorly where one limb branches from another, and a piece of putty could not be more perfectly moulded into this angle and smoothed off so as to leave no inequality. The bark of the cherry is blackish with transverse whitish streaks, and this cocoon presents the same colors and of tints almost the same, and what is most remarkable, it in one place shows a whitish streak continued from the bark upon the surface of the cocoon. And finally, in their perfect state, the moths imitate appearances which are common upon the particular trees on which they dwell; those upon deciduous trees, in the colors and scalloped margins of their wings resembling a tuft of withered leaves; those upon evergreens resembling a scar where the turpentine has exuded and concreted into a whitish mass.

Two American species of these curious insects are already known, both of them occurring in our State, upon the apple and other deciduous trees. To these we now add a third species, which resides upon the tamarack or American larch, *Abies* (*Larix*) *Americana*. It appears to be a rare insect. A specimen was presented to me by Dr. Emmons, in 1847, captured in the neighborhood of Albany that year by Mr. J. H. Salisbury, the chemist. The only other instance in which I have met with it, was upon a drooping larch in my front yard, in the year 1854. Upon

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a dead, leafless limb of this tree two worms were detected upon the twenty-second day of June, reposing near each other. They crawled from this limb by night to feed upon the leaves of the other limbs and returned to it to repose during the day, as though conscious that such tumors or excrescences as their bodies imitated were natural to diseased and dead limbs rather than those which were thrifty and in full foliage, and that they therefore would be less liable to attract notice here than elsewhere. They were observed daily upon this limb for a week, when one of them having disappeared, the limb was cut off to secure the other, although as I afterwards learned, the worm was now but half grown.

The YOUNG LARVA is pale ash-gray, identical in its hue with that of the limbs on which it resides. Its surface is varied with minute brown points, the larger ones of which are impressed. Along the middle of the back is a narrow black streak which is interrupted at each of the sutures. On each side of this is a row of small elevated black dots or warts, one on each segment, these dots giving out several black diverging bristles. On the outer side of each dot upon the fifth and the following segments is a small yellow spot. The fourth segment or last one of the thorax is black above and on its sides and has a transverse cream yellow spot on its hind margin; and the three segments before the last are black above, between the black dots. The lappets or lobes along the sides of the body are black at their tips and yield a few black bristles, and under these and also along the sides of the lappets and of the body between their bases arise numerous diverging white hairs, which are appressed to the surface on which the worm is reposing. The head is ash-gray, with several blackish spots, and is clothed with gray hairs.

The branch containing this worm was placed in a breeding cage, and also a twig clothed with leaves, and to this the worm immediately crawled, resting concealed among the leaves. But it was very intolerant of confinement, eating but little if at all, and in about a fortnight it perished. When in motion it has a very different appearance from what it presents when at rest, being much longer and of a nearly cylindrical form. It moves in a hurried impatient manner, its gait resembling that of the hairy Arctian caterpillars.

On carefully examining the tree on which these two worms were observed, July 17th, I was so fortunate as to find a mature worm and four cocoons. None could be discovered upon other larch trees in the yard, and these insects were probably the progeny of one single parent, which had strayed hither from a

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distance, there being no self-planted trees of this kind within a circuit of several miles. The first moth came from these cocoons upon the twenty-fourth of July and the others hatched soon after.

The MATURE LARVA was 1.38 long and about 0.25 broad when in repose. It was of a very dull umber brown color, resembling that of the old rough bark upon the body of the tree; its extremities were of an ash-gray tinge and upon each side of the fifth segment was a cloud of the same color. Under a lens some short, wavy, black streaks were perceptible upon the surface. Along the back were little projecting points with rounded summits, one on each side of the middle of each segment, those upon the ninth segment larger and of a paler color, and with a small pale yellowish spot forward of their bases. The lappets and hairs upon the sides were the same as in the younger worm. Many of the white hairs were dilated at their ends into flat triangular heads, ciliated or fringed at their tips. The under side of the body was naked and pale bluish green.

The cocoon is of an ash-gray color, of the identical hue of the bark of the smaller limbs to which it is attached, lengthwise. It is an inch and a quarter in length, 0.30 broad, flattened and moulded to the limb and partly surrounding it, its middle rising 0.20 or less than a quarter of an inch in height, forming merely a slight bulge upon the limb, which is only observed upon a particular search. Some wrinkles lengthwise at its ends and sides may also be seen, similar to those of the adjacent bark; and on its surface here and there is a little blackish wart-like spot, placed transversely, closely counterfeiting the glands upon the bark, and also minute blackish points, resembling the pores in the bark. It is of a tough texture with a roughish surface, very similar in appearance to the pale gray wrapping paper which was formerly in common use among grocers and shop men. Woven into its surface is an occasional hair derived from the body of the caterpillar. Its inner surface is smooth and of a paler gray color than exteriorly. The naked bark of the limb forms the floor of the cavity within. And the moth makes its exit by crowding itself forward and thus separating one end of the cocoon from its slight attachment to the bark.

The pupa is 0.60 long and 0.25 wide, slightly depressed, rather broadest across the middle, and tapered to a point abruptly, with a very minute tooth standing outward upon each side of its apex. Its relics are of a chestnut brown color, the sheaths of the wings and legs paler and yellowish.

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The moths are short, stout, thick-bodied, densely coated with long soft hairs, the males dark gray or almost black, the females white and a third larger. Both sexes have a singular crest upon the hind part of the thorax, formed of long curved scales which are glistening and resin-like, of an auburn brown color, arranged like the hairs of a moustache and jutting up from the surrounding prostrate hairs, forming a large tuft or protuberant oblong spot, broadest posteriorly and narrowing to its anterior end. The scales of this crest are of a peculiar form, being slender and hair-like with their ends dilated into an oval flattened knob, their shape thus resembling that of a spoon. When they are at rest these moths appear like excrescences upon the limb on which they repose, so exactly do they adjust themselves to it, their wings being held together in the shape of a roof, with their lower edges pressed firmly against the sides of the branch, and their white fore feet stretched forward resembling pitch which has exuded from a wound and running downward has dried in white streaks upon the bark.

The MALES (plate 2, fig. 5) measure 0.60 in length to the tip of the abdomen and of the wings, and one inch across the latter when they are spread. The head is densely clothed with white hairs in front and with blackish ones upon each side around the eyes. The feelers are minute and are wholly enveloped and concealed by long fine hairs, their ends forming a slight projection like the point of a camel's hair pencil. These hairs are blackish on their outer sides and ash-gray within. The antennæ are short, about a third of the length of the body, and are abruptly bent near their middle (as shown in the magnified fig. 5 *a*,) or with the ends straight in both directions from the crook near their middle, when they present the shape of an inverted V. They are furnished with two rows of coarse branches, which are long from the base to the crook, where they are abruptly shortened to half their previous length, and continue thence to gradually diminish in length to their tips. Each branch has a row of very fine hairs along one side, resembling eye lashes. The mouth has only the minute rudiments of a spiral tongue, and this not coiled as we see it in moths generally. The thorax is clothed with long hairs of a dark gray color, those at its anterior end white, and on its posterior part is the oblong crest of glossy spoon-shaped scales previously mentioned. The abdomen tapers slightly from its base to the tip and is clothed with blackish hairs above, whitish ones beneath, its apex having a dense tuft of long pure white ones. The wings are quite small for such a thick-bodied heavy moth. They are semi-transparent, being thinly covered with brown scales which are commonly denuded, the wings then appearing perfectly transparent like glass. Their veins are robust and white with darker irregular bands. The hind margins of both pairs of wings are entire and not in the least toothed or scalloped. When at rest they are pressed against the sides of the abdomen, in the form of a steep

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roof, the outer edges of the hind wings protruding more or less from under the outer edge of the fore ones. The legs are heavily clothed exteriorly with tufts of long snowy white hairs, the forward shanks having a tuft of blackish ones on their insides at the base.

The FEMALE (plate 2, fig. 6) is quite unlike the male, being much larger and differently colored. It has a peculiarly delicate or mellow appearance, from the softness of its colors and the thinness and translucency of its wings. The latter when extended measure an inch and a half or slightly less. Their hind edge is occupied by a slender white band or line. Forward of this is a narrow pale dusky band which is abruptly widened near its middle to double its usual breadth, this widened part occupying two of the intestines between the veins. This band is margined on its anterior side by a white line, by which it is separated from a much broader and more dusky band, which is waved in its middle in conformity with the dilation in the narrow band behind it. Forward of this the wings are milk white, crossed by four very faint equidistant wavy bands of the same delicate pale dusky hue with those behind, these bands being often obsolete upon the middle of the wing and distinct at their ends only. The veins are prominent and white, forming slender lines of this color crossing all the bands. The hind wings are of the same soft dusky tint as the bands on the fore wings, but more pale, and on their hind margin is a white line or slender band. The hind edge of both pairs of wings is perfectly entire as in the male, and their fringe is pale dusky, on the fore wings crossed with white lines at the tips of the veins. The body is clothed with incumbent milk white hairs, the tip of the abdomen having a pale brown tuft, and the crest on the base of the thorax appears like a large elevated blackish spot. The antennæ in this sex (fig. 6 *a*) are very slightly crooked in their middles, and their branches though equally thick with those of the males, are much shorter, being but about four times as long as the diameter of their stalk. These branches are longest in the middle, and are gradually shorter from thence, both towards the base and the tips.

This insect belongs to the Order LEPIDOPTERA and the Family BOMBYCIDÆ. Those European caterpillars which have the sides of their bodies projecting in lappets such as the larva of this species presents form a genus to which the name *Gastropacha* has been given, and it is to this genus that Dr. Harris refers the two American species of lappet caterpillars which have already been alluded to. One of these, named *Americana* by Dr. Harris (the *Ilicifolia* of Abbot and Smith, but not the species thus named by Linnæus) in its colors and other characters is intimately related to the European species of Gastropacha. The other, originally named *Bombyx Velleda* by Stoll, closely coincides with the insect which we have now described, and differs like it from the other insects included in the genus Gastropacha in several important points. It has the same singular

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crest upon the hind part of its thorax. In both these species the hind margin of the wings is entire and not scalloped as they are in the genus Gastropacha, and their wings are more thin, delicate and semi-transparent. In *G. Americana* the second vein which is given off from the outer side of the outer principal vein of the fore wings forks forward of its middle and both its branches terminate in the outer edge of the wing forward of its apex. In these two species the same vein forks much beyond its middle, the two branches diverge much more strongly, and both end in the hind margin of the wing, rather inside of the apex, the tip of the wing here being rounded and not forming an angle as it does in the former species. Such differences forbid our associating these insects together in the same genus. And as their deceptive appearance is one of their most prominent characteristics in each stage of their lives, the generic name *Planosa* (Greek πλάνος, a deceiver,) or in English, the cheaters, may appropriately be given to the *Velleda* and the species which we have here described. The best distinctive name for the latter will be that of the tree which it infests. We therefore propose calling it *Planosa Laricis*, or the Larch cheater.

From one of the four cocoons mentioned above, came five parasitic insects, which had destroyed the pupa. These gnawed their way out of the cocoon at short distances from each other, each making a round hole, the edges of which were rough and jagged. They were all females of a pretty species of Ichneumon fly (Family ICHNEUMONIDÆ Order HYMENOPTERA) 0.30 long, of a black color with the abdomen and legs tawny red and the hind feet, scutel and a band on the middle of the antennæ white. They pertain to the genus *Phygadeuon* of Gravenhorst, which genus is distinguished by having a depressed abdomen narrowed at its base into a slender stalk or petiole, a protruded ovipositor, the joints towards the base of the antennæ somewhat long and the small cell in the middle of the fore wings with five sides. This genus embraces a number of described species, most of which have the abdomen red or red and black, with the scutel also black and not pale as we find it in the present instance. This insect may be named

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The CHEATER'S PARASITE, *Phygadeuon Planosæ*. Its head is black with the feelers and orbits of the eyes broadly white. The antennæ are nearly as long as the body, black, with a broad white band beyond the middle, which includes four of the joints and is interrupted on its under side by a black line. The thorax is rough from numerous confluent punctures, which are more coarse and confused on its basal part, the angles on each side of the base above presenting a small tubercle or obtuse tooth. It is black above and tawny red beneath and on the sides, and shows several yellowish-white marks, as follows: a short line above on each side of the anterior middle; the wing sockets and a stripe from them to the head; an oblique stripe above the base of the anterior legs; a spot behind the wing sockets; a transverse square spot occupying the scutel, and an oblique spot upon each side of the base. The abdomen is as broad as the thorax, elliptic, flattened, convex above, concave beneath, the first segment narrowed into a petiole, the following segments abruptly bent downwards at a right angle with the first; surface with close fine distinct punctures; first segment smooth and polished, punctured each side at its apex, slightly margined by a slender elevated line along each side through its whole length; color tawny red, the five small segments which form the tip black with a slender white band on the apical edge of each. Ovipositor half as long as the abdomen, tawny red, its valves black. Legs tawny red, hind shanks black at their tips, hind feet white, their bases and tips black. Wings glassy-hyaline and iridescent, without spots, their veins and triangular stigma black.

The following VARIETIES occurred among the five individuals alluded to, two of them being of the first and one of the other variety.

a. An additional white spot, upon each side of the thorax.

b. The two short white lines above on the anterior middle of the thorax wanting.

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3. THE MAPLE.

AFFECTING THE LEAVES.

Round holes cut in the leaves, and their pulp consumed in rings and semicircular spots; round scales containing a small white worm between them, adhering to the surface of the leaves.

The MAPLE LEAF CUTTER, *Ornix Acerifoliella*, new species (plate 4, fig. 5.)

In the summer of the year 1850 an affection of the maple trees causing their leaves to turn brown, appearing as though they had been nipped by the frost, was so common in the eastern section of New-York that it became a common subject of remark. This withered appearance of the leaves began to be noticed the fore part of August and it continued to increase for three or four weeks, and remained until the fall of the leaves in autumn. It was so conspicuous that it could be plainly perceived as far

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as a grove of maples could be seen. And what appeared to be most singular, whilst the maples growing in forests were everywhere affected in this manner, those standing alone as shade trees in fields, and those planted around houses and along the streets of villages remained green and wholly exempt from the prevalent malady.

The cause of this fading of the leaves was readily discovered upon examination. They were found, when inspected, to present the appearances which are very well illustrated, plate 4, figure 6. The green parenchyma or pulpy substance of the leaf was destroyed in spots and irregular patches, leaving only the fine network of veins and the transparent cuticle. These spots were commonly in rings or in segments of a circle, with the centres green and unaffected. In addition to these, holes of a nearly circular form appeared in the leaves, about a quarter of an inch in diameter, with others of a smaller size. A dozen or more of these holes were at that time found in almost every leaf. And some of the pieces which had been cut out of the leaf, forming these holes, might be observed, adhering like round scales to the surface of the leaf, some on its upper others on its under side. On elevating this scale from the surface of the leaf, another smaller one was found beneath it, and between them was a small white worm, which was evidently the artizan by whom all this work had been done—cutting out these circular pieces from the leaf to form a cloak for himself, and when hungry feeding upon the pulpy substance of the leaf, thus forming the circular and irregular spots seen upon it. Occasionally one of these scales might be observed to move slightly along, the worm at such times protruding its head from under the edge of the scale and with its feet pulling its unwieldy domicil to another part of the leaf.

Generally the worm was found inclosed by three of these round pieces which it had cut from the leaf probably at successive periods of its life. First was a small one upon its back, about 0.18 long and two-thirds as broad, slightly concave on its under, convex on its upper side. Next was a larger piece, of similar form, placed on the under side of the worm, its edges overlapping those of the first piece, its concavity facing the con-

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cavity of the first piece, thus forming a little hollow between, within which the worm lies like a clam within its shells. Finally, covering these two was a third piece still larger, 0.30 to 0.40 in length, placed on top of the first. The several pieces were connected and held together at their edges by fibres of fine silk. On the left hand of the leaf, plate 4, fig. 7, shows one of these cases its natural size; that on the right hand represents it magnified, whilst three cases of smaller sizes are represented adhering to the surface of the leaf. Frequently, as is shown in these illustrations the largest piece is cut from the leaf where it is crossed by one of the coarse veins, perhaps to render the structure more substantial

The worm within these cases is nearly a quarter of an inch in length when mature. It is slender, and of a flattened cylindrical form, soft and contractile, composed of thirteen segments marked by slight intervening constrictions. It is dull white, the head, which is strongly depressed, and the three thoracic segments pale rusty brown. An interrupted broad blackish stripe along the middle of the back is more or less distinct. Only the three pairs of legs upon the thoracic segments are distinctly developed.

These worms, or many of them at least, are carried to the ground upon the leaves, when they fall from the trees in autumn. They remain in their cases and change to pupæ, among the fallen leaves beneath the trees, in which situation they may be found early in the following spring.

The pupæ are 0.18 long, pale yellow, and of an oval form, tapering abruptly to a point at their tips. The wings, legs and antennæ are enclosed in separate sheaths, not attached to each other or to the surface of the body. Upon the back each of the segments of the abdomen except the two last have a row of minute teeth along their anterior edges, inclined backwards, like the points of needles. By means of these teeth, the pupa when ready to disclose the perfect insect, crowds itself forwards out of its case, by bending itself alternately up and down, the sheaths of the feet upon the opposite side of the body serving as props to aid in effecting this movement. From it comes a small moth of a dark brilliant blue color with a bright orange yellow head,

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which may frequently be seen during the month of May, flying by day or resting exposed upon the leaves, in forests and along their borders.

The MOTH (plate 4, fig. 5, the cross lines above the left wing indicating its natural dimensions) measures 0.35 across its wings when they are spread. The fore wings are brilliant steel blue or sometimes bluish green, with a purple reflection, and without any spots. The mid-vein forms a deep groove, lengthwise, from the base parallel with the inner margin almost to its tip, and on the middle of the wing towards the tip is another similar groove. The tips of these wings are commonly bent inwards, giving them when closed, the appearance of a little pod enveloping the abdomen. Their fringe is black interspersed with scales of brilliant blue. On their under sides they are dusky with a grayish silvery lustre and a pale purple reflection. The hind wings are pale smoky brown and translucent, with pale blue and purple reflections, and their fringe is pale brown. The head on the crown and between the antennæ has a dense tuft of erect bright orange yellow hairs. The feelers are straight, thread-like, shorter than the head, inclined obliquely downwards and forwards, of a gray color. The antennæ are black-brown, very thick and robust, thread-like, their tips curved and often spirally coiled. In the males they show a short spine-like tooth on each side of the apex of each joint, giving them a doubly serrated appearance. The thorax is brilliant steel blue. The abdomen is quite short and conical in the males, cylindrical and with a thin tuft of hairs at its tip in the female. In common with the under side and the legs, it is dark brown with a strong satin-like lustre, the feet being whitish.

This moth pertains to the Family TINEIDÆ of the Order LEPIDOPTERA. Many of the members of this family reside in movable cases of various kinds, which they construct from the substances on which they feed. The clothes' moths, furrier moths, and others thus fabricate garments for their covering. Others roll pieces of leaves into cylindrical or conical tubes, within which they reside. And a few cut out circular pieces from leaves and stitch them together as it were, like the insect we have now described. The moths having this last habit pertain to the genus *Ornix* of Treitschke, one of the Greek terms for a bird, the wings of some of these moths resembling those of particular birds, which has led to their being named the goose-winged, turkey-winged, &c. The species under consideration, however, will be best distinguished by the name of the tree which it infests, and I accordingly call it *Ornix Acerifoliellus*, or the Maple leaf cutter. In the arrangement of the British entomologists it would probably be referred to Mr. Curtis's genus *Eriocephala*.

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This moth was much more common five and ten years ago than it is at the present time. With the return of the month of May each year it was then met with in numbers in the forests. But for two years past not one has been seen, and last spring on searching among fallen leaves for its pupæ where they were formerly found in plenty none could be discovered. Still, a few holes perforated in the leaves of maples continue to occur, showing that the insect is still present in the neighborhood, though in greatly reduced numbers. These holes are always nearly circular when they are first cut, but by the subsequent growth of the leaf they become oblong. A small Ichneumon fly of a pale yellowish color, the tenth of an inch in length, with black antennæ longer than its body, has repeatedly hatched from the cases containing the pupæ of this moth, and this has probably been one of the most efficient agents in reducing its numbers.

The fact has already been stated, that these insects do not invade trees standing alone in fields and in yards around houses. The reason of this is sufficiently evident, now when we know their history. The leaves when they fall from such trees are blown away by the winds, or are trampled into the earth by cattle traveling around and standing under them. If any of these worms, therefore, happen upon such trees, when the leaves fall and carry them to the ground, they become scattered and destroyed. And a knowledge of this fact at once suggests a remedy, whereby to save the trees from the depredations of this moth. Groves of maples more especially which are valued for the sugar they produce, will be materially injured, there is no doubt, by having their foliage destroyed as it was by these insects in 1850. But all mischief of this kind will probably be prevented by allowing sheep or cattle to range the grounds occupied by the sugar orchard; and if, notwithstanding this, the leaves of particular trees show that they are preyed upon by this moth, it will be well after the leaves have fallen in autumn, to feed salt to the animals under such trees, that any insects among the leaves may be trampled upon and destroyed.

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4. THE POPLAR.

AFFECTING THE LEAVES.

In July, consuming all the leaf except its coarse veins, and reposing in a cavity formed of leaves drawn together like a ball; large black caterpillars with white and yellow dots and stripes, and a hump on their backs anteriorly and behind.

The WHITE-S, *Clostera albosigma*, new species, (plate 2, fig. 4.)

Several different kinds of singular looking caterpillars, humped upon their backs and otherwise closely related to each other, occur upon the poplars and willows in Europe and this country. Although these insects upon the two continents very much resemble each other, the remark made by Dr. Harris appears to be correct, that they differ essentially in their caterpillar state, and their moths also present certain characters, which, on close comparison, will enable us to distinguish them. One of our species, named the American Clostera by Dr. Harris, corresponds in its marks with the *anastomosis*, and still more closely with the *reclusa* of Europe; and we come now to present another similarly analagous to the *curtula* and *anachoreta*.

The caterpillars attain their full size about the middle of July and are then an inch and a quarter in length, black, dotted with white above and with numerous wavy white lines on the sides, where are two rows of yellow spots, and on the back are four dull white stripes alternated with orange yellow on the middle of each segment. On the top of the fourth or last thoracic segment is a conspicuous black hump prolonged into a teat-like protuberance and a smaller hump upon the eleventh segment.

The CATERPILLAR has a cylindrical form, and is clothed with fine white hairs. The white lines along each side form divers shaped rings and letter-like marks. The stripes upon the back are interrupted upon the two humped segments, and upon the middle of the two segments between the head and the anterior hump is a slightly elevated point in each stripe, of a brighter orange color. The anterior hump is inclined backward, and is furnished with two long and numerous short white hairs. The breathing pores form a row of broad oval black dots along each side, each dot surrounded by a white ring. Above these is a row of oblong yellow spots and below them another, each spot having a pimple in its centre from which arises a hair, and the posterior spots of the lower row having two of these pimples. On the third and fourth segments, the breathing pores being wanting, the two yellow spots are confluent, forming a single large spot with a pimple in its centre. The head is black and the Y-shaped

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suture upon its front is tawny yellowish. The legs are black and the prolegs pale brown with a white ring on their middle.

Several of these caterpillars commonly live together upon a particular limb, which they strip of its leaves, eating all the leaf except its midvein and portions of the other coarse veins. They construct a kind of nest by drawing two or more leaves together, with the silken threads which they spin from their mouths, forming a hollow ball-like cavity within, in which they repose when not engaged in feeding. Three of these caterpillars which I transferred with their nest to a breeding cage on the 14th of July all spun their cocoons within the nest a day or two afterwards. The cocoons were formed of yellowish gray silk loosely woven and attached to the under side of a leaf. The moths all came out on the 25th of July, thus remaining in their pupa state but a little over a week. The moth crawls from its cocoon, and with its fore feet clinging to a twig, hangs perpendicularly downwards, swinging with the breeze, until its wings become dry and stiff. It then discharges one or more drops of an opake brick red fluid, and takes to flight. One of these moths dropped a number of eggs, which were of a hemispheric form and dark brown with a wide glaucous gray ring on the outer margin.

The MOTHS (plate 2, fig. 4) measure an inch and a half across their wings when spread. They are greyish brown, of a pale umber hue, with a large oval velvet black spot, reaching from the front between the bases of the antennæ to the middle of the thorax. The fore wings are slightly sprinkled with black atoms, and are crossed by four nearly equi-distant pale lines, forming slender bands, each of which is faintly margined on its hind side by a darker line. The two anterior bands are nearly straight and parallel, crossing the wing transversely. The third is less distinct than the others and can scarcely be discerned in some individuals. It begins on the inner margin in contact with the fourth band, and inclining towards the second, with a gentle curve becomes parallel with it through most of its length. It commonly ends before reaching the outer margin and is interrupted in its middle, and is sometimes dislocated at this interruption, as represented in the figure, its outer part being moved backwards from the line of its course. This band is margined posteriorly by a broad band which is but slightly darker than the ground color of the wing and of an olive green tint. It is broader on its inner end, where it is cut across by the fourth band. This last is nearly parallel with the hind margin, and is straight the first half of its length, when it curves slightly forward and then gradually turns directly backward, running parallel with the outer margin a short distance, and changing to a vivid snow-white color; with a curve it again turns outward and forward, and finally with an abrupt turn it runs straight and obliquely backward to the outer margin. Its white outer end thus nearly forms a letter S, which is the most conspicuous mark upon the wing. Immediately back of this on

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the outer edge is a rust red spot, and the outer half of all that part of the wing which is back of this fourth band is of a darker brown color, becoming velvet black at its anterior side next to the band. Half way between the fourth band and the hind edge, on the middle of the wing, an irregular row of black spots or transverse streaks is more or less distinct. The hind wings are paler, and beneath are crossed by a slightly waved dark brown line.

This insect pertains to the same family with the handmaid moth, described in the preceding pages, and to the genus *Clostera*, which is characterised as having the scales upon the thorax elevated into a crest, the wings entire at their hind edges, and the antennæ (fig. 4 *a*) short, curved and with two rows of branches in both the sexes. The English species are popularly named chocolate-tips, the dark spot at the tips of their fore wings being of a chocolate brown hue. But in the species before us that tint is so slight as to be scarcely obvious, and it will be better distinguished by the name White-S, *Clostera albosigma*, this character being in most individuals more conspicuous and vivid than it appears in our figure of the species.

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INFESTING FIELD CROPS.

1. WHEAT.

AFFECTING THE STALK.

Externally on the stalks sucking their juices, turning the field white in spots where they are numerous; after harvest migrating to corn; a small narrow coal-black bug, with closed white wings, having a black dot on the middle of their outer edge.

The CHINCH BUG, *Micropus leucopterus*, SAY. (Plate 4, fig. 2, and 2*a*, the same magnified.)

This is unquestionably one of the most pernicious insects which we have in the United States. The locusts of Utah and California are the only creatures of this class which exist within the bounds of our national domain, whose multiplication causes more sweeping destruction than does that of this diminutive and seemingly insignificant insect. Although it has never appeared as a depredator in this section of the Union, and was for a long time supposed not to occur to the north of the celebrated "Mason and Dixon's line," I have at different times met with three specimens of it in our own state, and Dr. Harris found it once in Massachusetts. As it exists in our midst, therefore, we have reason to fear that peculiar seasons or other favorable circumstances may at some future time arrive, which will cause it to multiply and become as destructive here as it now is in some of our sister states south and west. Hence its history is as deeply interesting to us as that of any other insect within our borders. And as enquiries respecting its correct name, its habits and depredations are so frequently appearing in our agricultural papers, I probably cannot render a better service than to present these topics as fully and definitely as I am enabled to do from the information which I have gathered.

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The chinch bug is a small insect of a coal-black color, with snow white wing-covers, which are laid flat upon its back, and show a black dot upon the middle of their outer sides. The figure representing this insect its natural size (plate 4, fig. 2), will give the reader a very correct idea of its appearance. It belongs to the Order HEMIPTERA, the same order to which that disgusting object, the bed-bug belongs, and it exhales exactly the same loathsome smell which that insect does. It is by puncturing the plants with its sharp, slender, needle-like beak, and sucking out their juices, that this insect subsists. As it does not wound the plant by gnawing it, one would suppose that it could do no great injury. But their numbers are so immense that they *bleed* the plants on which they congregate, so copiously, as not only to arrest their growth, but cause them to wither and die. They prefer wheat to every other kind of herbage, and when that is not at hand they gather upon oats or Indian corn or grass; but they seem to be able to nourish themselves upon the juices of all kinds of vegetables. They remain upon the wheat until it is harvested. They then migrate to oats or corn growing adjacent to the wheat field, running nimbly over the ground, appearing at first glance like a swarm of black ants. Though they have wings they seldom use them, and only fly the length of one or two paces at a time.

It was just at the close of our revolutionary struggle, or about the year 1783, that this bug was first noticed as a depredator upon wheat, in the interior of North Carolina. It was at first supposed to be identical with the Hessian fly, which at this time was making such destruction in wheat crops on Long Island and in New Jersey. Two years before this, the British army accompanied by a detachment of its German auxiliaries had marched through North Carolina, and the battle of Guilford was fought. Mr. J. W. Jeffreys states (Albany Cultivator, first series, vol. vi, p. 201) that an aged and highly respectable citizen of Orange county, N. C., informed him that it was "immediately after this event that the Hessian fly or Hessian bug destroyed their crops of wheat; and they believed and do believe to this day (1839), that those soldiers left the flies or bugs as they passed through the country." The insects continued to increase and spread through

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the Carolinas and Virginia for several years. In 1785 the fields in North Carolina were so overrun with them as to threaten a total destruction of the grain (Webster on Pestilence, vol. i, p. 279). And at length the crops were so destroyed in some districts that they were obliged to wholly abandon the sowing of wheat. It was four or five years that they continued so numerous, at this time.

The only particular account which was published, of the insect and its habits at this period, of which we have any knowledge, appeared in London, in Young's Annals of Agriculture, vol. xi, p. 471. It is from this notice of it, Kirby and Spence state, that they derived the information given in their Introduction to Entomology (p. 127, American edition), which is as follows: "America suffers also in its wheat and maize from the attack of an insect, which, for what reason I know not, is called the chintz bug-fly. It appears to be apterous, and is said in scent and color to resemble the bed-bug. They travel in immense columns from field to field, like locusts, destroying everything as they proceed; but their injuries are confined to the states south of the 40th degree of north latitude. From this account the depredator here noticed should belong to the tribe of *Geocorisæ* Latreille; but it seems very difficult to conceive how an insect that lives by suction, and has no mandibles, could destroy these plants so totally."

About the year 1809, we are informed by Mr. Jeffreys that the chinch bug again became so destructive in North Carolina, that in Orange county the farmers had to abandon the sowing of wheat for two years, and according to his statement the insects were subdued hereby. At various other times of which we have no record, it has undoubtedly been abundant in that and the adjacent states, that section of country appearing to be its head quarters.

In 1839 we have accounts of its having again become excessively numerous and destructive in Virginia and the Carolinas. W. S. Gibbes, writing from Chester district, S. C., June 27th, says, "Though we are not yet afflicted with the grain worm (wheat midge), nor much injured by the Hessian fly, a pest has appeared among us within the last two years, which from their

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prodigious numbers threaten to be even a more serious evil. They are called chinch bugs in Virginia, though they have no resemblance to our domestic pests (the bed-bug, which is commonly named the "chinch" at the south), but their disgusting smell. They are nearly the shape and size of the small black flour weevil; can fly, but take to their wings reluctantly; have no mandibles, but a proboscis with which they penetrate the stalks of plants near the joints, and suck them to death. They have destroyed my oat crop totally; I shall not make the seed sown; my white May wheat, harvested the 28th of May, came to maturity too early for them, and was but slightly injured; but my white bearded wheat, harvested the 12th of June, was seriously injured by them—many ears not having a single grain filled in them. Bad as this is, it is nothing to what followed; for as soon as the small grain was cut, they took to our cornfields in such myriads as is inconceivable to any but those who have witnessed them. I have seen some of my corn so perfectly black with them for two feet up, no particle of grain was to be seen but five or six inches of the tips of the leaves; and they hung to the under parts of them in knots like little swarms of bees. It takes them only one or two days to destroy the corn. From such an attack I saw no remedy but burning them up, corn and all; and by prompt doing so in that part of the field into which they first migrated in such immense numbers, hope I have saved the rest of it from total ruin, though patches of corn in some of my other fields have been totally killed." (Cultivator, vol. vi, p. 103.) Although Mr. G. does not surmise that this excessive increase of the chinch bug was caused by any peculiarity of the season, yet we learn from another part of his communication that the weather at this time was remarkably dry and hot. He says, "We are suffering severely from drought. The whole spring has been dry. Our gardens are burnt up, without having yet given us anything. Our corn is in a most deplorable state—so wilted it must perish if we do not get rain in a few days. We have had but one rain to wet the earth below the furrow of a shovel plow since the 8th of May, and very little all April."

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J. W. Jeffreys, writing from North Carolina the same year, gives the following history of their operations through the season. "They make their appearance in our wheat fields the last of May and the first of June, and continue therein and in oat fields until the grain is cut and secured, and they then march with all their forces and commence their attack on our cornfields, where they continue until the cold weather commences, and then take flight to the woods, though you may discover them in our cornfields sheltered in the boot of the stalk in the depth of winter, yet they rarely survive the winter. I have discovered them in July taking flight from our wheat and oat fields, and you may see thousands and millions flying to the woods, from which I am under the impression that they never return, but they leave a new generation behind, which are more destructive than their progenitors. No person can have the faintest idea or conception of the ratio of their increase, unless they study their history and movements. At this time there are myriads in our cornfields attached to the stalk, and they shelter under the boot or shuck of the stalk, and there multiply beyond conception, hundreds perhaps thousands attached to a single stalk." (Cultivator, vol. vi, p. 201.) It would appear from this statement, that in July the old insects, probably, which are about to perish, take wing and fly to the forest; and that on the approach of cold weather a large part of the new generation also makes the same migration. It may be that there is some truth in this statement, as the bugs would thus obtain a more secure shelter than they can find in the open fields; but I have seen no other testimony corroborating this.

The bug had now become so numerous in Carolina and Virginia, that with its continued increase in 1840, the total destruction of their crops appeared inevitable. The prospect was so alarming, that Sidney Weller, of Brinckleyville, Halifax co., N. C., and others in his neighborhood, united in the spring of 1840, in pledging a handsome sum as a prize for some feasible method to arrest the career of this depredator. But at this juncture, Providence interfered to accomplish what no human agency could have effected. Instead of being dry like the two or three preceding years, the summer of 1840 proved to be of an oppo-

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site character, and the ravages of this insect were at once suppressed. Mr. Weller, writing in November, says, " Our fears were disappointed and our hopes exceeded as to this pest, by the hand of an overruling Providence. The season turned off wet and very propitious to crops of all kinds, and the ravages of this bug were arrested. Even fields of wheat that had been greatly injured, suddenly revived and produced tolerable crops; and the corn crop, which last season in places here, was ruined, escaped uninjured." (Cultivator, vol. viii, p. 21.)

It was about this period that the Chinch bug began to be noticed along the upper Mississippi, and through the northern parts of Illinois. It made its appearance there simultaneously with the establishment of the Mormons at Nauvoo (1840–1844) and many ignorant people firmly believed they were introduced there by these strange religionists, and " Mormon lice " became the name by which they were currently designated, through that district. When we have such instances of the credulity and ignorance of our own day and generation, let us not smile at our patriotic grandsires for deeming that the Hessian soldiers were breeding and shaking off pestilent vermin and scattering them over the country wherever they marched. It is quite probable that these insects were originally natives of Illinois, and now became multipled in consequence of the settlement of the country and the extensive cultivation of wheat, giving them a copious supply of more congenial food than they previously had access to; or if it was newly introduced there at that period, as was universally believed, it probably arrived by gradually advancing from the south. In that excellent periodical, the Prairie Farmer, which has contributed so much to render the agriculturists of the west enlightened and intelligent in their vocation, several communications upon the chinch bug appeared in 1845 and the following years. An enlarged figure of the insect was given at this time (vol. v, p. 287) and in September 1850 vol. x, pp. 280, 281) a summary account of the insect with a description and a scientific name for it, appeared from the pen of Dr. Le Baron. As this is one of the most important original papers which has ever appeared, relating to this insect, and the volume containing it is now nowhere accessible, we reproduce it entire in the subsequent pages.

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The chinch bug has now multiplied and extended itself over all parts of Illinois and the adjacent districts of Indiana and Wisconsin, and has become a most formidable scourge. The dry seasons which have recently occurred have increased it excessively. In passing over northern Illinois, in the autumn of 1854, I found it in myriads. In the middle of extensive prairies, on parting the grass in search of insects, the ground in some places was found covered and swarming with chinch bugs. The appearance reminded me of that presented on parting the hair on a calf that has been poorly wintered, where the skin is found literally alive with yermin. Our western neighbors have for many years been congratulating themselves upon the security of their wheat crops, exempt from the midge and other insect depredators which were causing us such losses here at the east. But they now find they have in the chinch bug a foe more formidable and destructive even than the wheat midge; since it not only cuts off their wheat but in many localities it takes the corn and other cultivated crops also. Although it is commonly only a strip upon the outer edge of the field which they devastate, yet in several instances the entire field is invaded and swarms with them, so that no grain is developed in the heads, and some have set fire to their wheat fields to consume the hosts of these vermin which were gathered therein, with the hope of hereby lesening the numbers upon their farms the following year. The disgusting smell, moreover, which these bugs emit, is most loathsome and sickening to the laborers engaged in harvesting the wheat fields. Cilley's reaping machine, made at Elgin, Illinois, has small deep boxes sunk in the platform, for the raker and three binders to stand in, that they may not have to stoop to their work as they would if standing upon the platform. As the machine is in operation, the feet of the men standing in these boxes become buried among the insects and fine chaff which fall into them. The men are so annoyed by these vermin, thus covering their feet and crawling up their legs, that they many times stamp to shake off and crush the tormenting things. And whether dead or alive, when thus heaped together in masses, such a stench arises from them, as, when wafted by the air it happens to come full in one's face, is the most loathsome and nauseating of anything that can be imagined.

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This information is communicated to me by Mr. Albert Burnet, of Mercer county, Ill., who further states, that in that vicinity the chinch bug was the most numerous last year (1855) that it has ever been known. Having attended a reaping machine through the season of harvest, he says it was noticed in a number of instances, that these insects were most numerous upon the south and east sides of the fields. This is probably owing to these parts of the field being more warm and dry, from their greater exposure to the sun. And where a low damp spot occurs in a field, the grain or corn is there wholly exempt from injury, although all the rest of the field may be badly affected. He says he first saw the insect in 1850, at which time it was very abundant. The two following years it was but little noticed, but the three dry summers which have now occurred have increased it prodigiously.

William Patten, of Sandwich, De Kalb county, informs me that it was in 1850 that it was first noticed in his neighborhood, and that last summer it was more destructive than it had ever been before, the last sowed wheat being greatly injured by it in many fields. The early wheat in Illinois, as in Carolina, is ripened before the bugs become so numerous as to injure it.

Charles Hastings of La Salle, tells me the chinch bug had not been noticed in his vicinity until the year 1854, and it then did but little damage, but the following year many fields were much injured, and some were so much damaged that they were not harvested.

Edward McCollister of Juliet, tells me it has been less destructive the present year (1856) than it was last, though it has everywhere been quite a serious evil this season. Wheat from fields which have been infested by the chinch bug is readily distinguished by the grain dealers, the kernels not being plump and full, but more or less shrivelled and light of weight. These insects seldom if ever injure the first crop upon newly broken prairie. A strip of greater or less width upon one of the sides of a field is sometimes destroyed in autumn, when the plants are but a few inches high. Entering the field upon the side adjacent to an old wheat field, they advance with the regularity of an army, farther and farther, killing every leaf and spear as they

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proceed, until a frosty night occurs, when their operations instantly cease.

Dr. Marshall of Keithsburg, informs me that in destroyed patches individual stalks sometimes occur, which have been missed by them. These remain green and thrifty, and their heads become well filled, when all around is bleached and withered. It is commonly a strip, two, three or even five or ten rods in width upon one of the sides of a field, which is whitened and destroyed by them; but in some instances they enter a field in a narrow strip, and then spread out into a large patch.

D. Williams of Geneva, Wisconsin, says the chinch bug made its advent there in 1854, coming apparently from the south, its nearest approach the year before being thirty miles south. In a letter written July 9th, 1855, he says it had that year caused considerable damage, especially in spring wheat, but a heavy rain two weeks before had checked its ravages.

The first appearance of the chinch bug at a particular locality and its progress from year to year, is related with more exactness than I have elsewhere seen, in a communication to the Country Gentleman (vol. v, p. 396) from E. C. Smith of Christy's Prairie, Ia., from which the following extracts, containing further information upon the economy and destructiveness of this insect are taken. It is dated May 20th, 1855, before the extent of the depredations of the bug that year could be fully known, and was accompanied with specimens and a request for information as to the correct name of the insect, it being termed the "corn fly" in that neighborhood. Mr. Smith says:—

"The first time they were ever observed in this vicinity, so far as I have been able to ascertain, was nine years ago last summer. They were seen in a cornfield, about three miles from this place. They appeared to come from the stubble of a wheat field that bordered on the corn. They did but little damage. A few successive days of rainy weather put a stop to their progress, and nothing more was seen of them, that season. Two years later, they appeared on the farm of one of my neighbors, about half a mile distant. They came apparently, as before, from wheat stubble, though none had been observed in the wheat while growing; and they began on that part of the corn adjacent to it.

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But few appeared at this time, and not much damage was done. In 1851, I observed them for the first time, on the farm where I now reside. The field in which they made their appearance had corn on one side and oats on the opposite side, with a strip of wheat between. They were seen immediately after the wheat was cut, on the rows of corn next to the stubble; and were so numerous, as to cover from one-fourth to one-half of the stalk, in many of the hills. The corn soon began to wither. They did not devour the solid parts of the plant, but pierced the outer part or skin, full of holes, or destroyed it in large patches, here and there, over the stalk, and appeared to feed on the juice. A few rows next to the wheat, were completely destroyed. The crop was more or less injured to the distance of about eight rods from the stubble. On the opposite side, the oats were killed to the distance of two or three rods from the wheat. The remainder ripened without injury.

"They appeared again the next year, and about the same time of the year; but did little damage. Strange to say, it had not yet entered my thoughts, that they had done, or could do, any damage to wheat. The next spring, (1853,) my wheat looked unusually promising. But when it had grown to the height of a foot or more, I observed that more than half of it had stopped growing. This portion was only six or eight inches in height, and it grew no more, but withered and died; from what cause I could not imagine. The same fly appeared again in the corn, after the wheat was cut. The rank growth of the corn, together with one or two heavy showers, prevented it from doing much injury.

"Last summer, there was the same appearance in the wheat, as the summer previous. A part of it dwindled away, after it had grown to the height of a few inches. At the time of cutting the wheat, these insects were observed, in motion towards the corn, which was close by. In a few days the corn nearest to the stubble was so covered with them, as to appear, at a little distance, as if covered with black paint. The corn was backward and dwarfish, and the season excessively dry, both of which circumstances favored their destructive effects. About fifteen acres of corn was destroyed by them. They swept over about

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forty acres more, some parts of which were nearly destroyed, others only slightly injured. One of my neighbors, had twenty-six acres of corn completely destroyed by them last summer, and fifty acres more greatly damaged. There was not a corn-field on the prairie, in which the crop was not greatly damaged. I do not know that they have ever been seen in this region, anywhere else than on the prairies, till last summer. Then, they were seen on farms formerly covered with timber, many miles distant from any prairie.

"The attention of people here, was so thoroughly called to this insect, last summer, that when it appeared this spring, it was readily recognized. It was first observed on fences, or flying about, and alighting here and there, like other winged insects. Soon it was found about the roots of wheat,—then in oatfields, and in timothy grass. Wherever it has been seen among grain or grass, some of the blades were seen to turn yellow, and the growth to be checked, or stopped entirely; and in many cases, the whole plant completely killed. Probably, not less than one-third of the wheat crop, in this vicinity, has already been destroyed by them; and their destructive operations are still in progress."

In Virginia and Carolina during the past year or two there has also been great complaints of this insect, and the present year an editorial in the Richmond (Va.) Whig, the latter part of July, says "A general alarm, from the mountains to the seaboard is felt for the corn crop. The chinch bug is universal, and like the sand of the sea-shore for numbers. Many corn-fields are entirely destroyed by them already, and others can only be saved by timely and copious rains."

The chinch bug is probably a common insect through all the southern states. I have received specimens of it from Mississippi, and am informed it some years has done much injury to the crops of Indian corn there. I also have a specimen from western Pennsylvania. It therefore appears to occur in all parts of the United States between the Atlantic and the Mississippi, although in the Eastern and Middle states it is exceedingly rare.

The three specimens which I have met with in this state, occurred upon willows in the spring of 1847 and May 12th 1851.

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It would thus appear to leave its winter quarters with nearly the first warm days of spring, and resort to the earliest foliage which puts forth, for nourishment after its long fast. It passes the winter under the loose bark of decaying trees, in the cracks and crevices of stumps and logs, and similar sheltered situations. Mr. Albert Burnet informs me that in turning over chips and pieces of boards lying upon the surface of the ground he has frequently met with it alive, in February, though in a torpid state upon cold days.

The history and description of these insects given in 1850 by Dr. Le Baron, of Geneva, Kane Co. Ill. in the Prairie Farmer, is as follows:—

These insects have prevailed the present season throughout this and the adjoining counties in ruinous profusion. The season has been excessively dry, which has probably been favorable to their multiplication. I find by reference to the back numbers of the Prairie Farmer that they have been equally destructive in other sections of the country in former years.

They make their appearance in the latter part of June, confining their depredations at this period chiefly to the spring wheat. So rapid is their multiplication, that in the course of a few days from the time of their first appearance, whole fields are overrun by them, every straw being more or less infested.

They belong to the suctorial division of insects, and do their damage by imbibing the juices of the plants which they infest. The sucking instrument, as in other insects of the kind, consists of a slender four jointed beak, which when not in use is bent back under the body, and rests upon the breast. Upon that side of the beak which is undermost when at rest, is a narrow groove, in which is contained an extremely fine bristle-like lancet, which is capable of being disengaged from its sheath and used as an instrument for puncturing the straw. When a flow of sap has been thus produced, the lancet is returned to its sheath, and the whole instrument is used for the purpose of suction. Collected in dense clusters, chiefly about the lower joints of the straw, with their suckers partially inserted into it, or applied to the punctures previously made, these little insects appear to repose in luxurious contentment. Meanwhile the grain being deprived of its necessary nutriment, becomes wholly blasted or much shrunken, whilst the straw turns white prematurely and at length crinkles down beneath the lancets of this infinity of phlebotomists.

When the wheat becomes too much dried up to afford them nutriment, they leave the wheat field, and may be seen at this time running on the ground in all directions in search of appropriate food. Next to wheat they usually attack oats, then corn, and lastly timothy or herds-grass; and if none of these are at hand, they will subsist upon some of the wild grasses. The Indian corn is so rapid and vigorous in its growth that it is not usually much injured; yet I have seen, this season, whole fields blackened with them, and large patches of corn blasted and prostrate, as if a fire had run over them.

They migrate from one field to another by running over the surface of the earth. Nevertheless when they are obliged to move to a distance, the perfect or winged individuals readily take to flight, and they have been seen flying in dense swarms.

They are seen in about equal numbers in their different stages of growth. The younger specimens are found especially abundant in the earth to the depth of an

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inch or more, about the roots of the grain; from which it may be inferred that the eggs are deposited in this situation, though I have not as yet succeeded in discovering them.

These insects present, in the course of their development, the following characters. The youngest individuals are vermillion red, the thorax or anterior part of their bodies inclining to brown, and with a white band across the middle of the body, comprising the two basal segments of the abdomen. As they increase in size they become darker, changing first to brown, and then to a dull black, the white band still remaining. The antennæ and legs are varied with reddish. In their final or perfect state they acquire white wings varied with a few black spots and lines.

These insects belong to the Hemipterous order, and to the genus Rhyparochromus in the family of Lygæidæ. The generic name is of Greek composition, and signifies sordid color, in reference to the dull colors of the majority of the species. I have not at hand the means of determining whether the present species has been scientifically described and named. It might be appropriately called the Rhyparochromus devastator. The following may serve for a more accurate description of the perfect insect than, so far as I am aware, has been heretofore published.

Length 1 2-3 lines, or three-twentieths of an inch. Body black, clothed with a very fine greyish down, not distinctly visible to the naked eye; basal joint of the antennæ honey-yellow, second joint the same tipt with black, third and fourth joints black, beak brown; wings and wing-cases white; the latter are black at their insertion, and have near the middle two short irregular black lines, and a conspicuous black marginal spot; legs dark honey-yellow, terminal joint of the feet, and the claws black.

So sudden is the invasion and so rapid the progress of these insects, that it is scarcely probable that any preventive or remedy for their devastations will ever be discovered. Yet it is an admirable provision of nature, that those creatures which multiply at certain seasons in alarming profusion, do as suddenly and often as unaccountably disappear. The common method by which the excessive increase of such creatures is kept in check, is by the appropriation to each of them of some parasitic insect, which multiplies coextensively with them, and by preying upon them restrains their increase within moderate limits. The migratory locust, for example, and also the Hessian fly, and most kinds of caterpillars, are known to be infested by parasitic insects. It is devoutly to be wished that nature may have provided this, or some other remedy, against the indefinite extension of the ravages of the present species, whose origin and progress seem to be so wholly removed from the reach of human control.

Little requires to be added to this account. The eggs of these insects according to an editorial in the Southern Planter (vol. xv, p. 269) are deposited in the ground, in autumn, where they remain through the winter and until the warmth of the ground the following year causes them to hatch. This takes place in May at the South and probably not till June at the West.

This insect never appears in the form of a worm or maggot, like the larvæ of moths, flies and beetles. Still, in its larva state it is quite unlike what it is after it acquires wings, being more flat and broad and having considerable resemblance to a bed-

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bug, though of a brighter red color when it is small. One of these young chinch bugs which I met with in some diseased wheat straw sent from Virginia presented the following characters:

The YOUNG LARVA when 0.06 long is about 0.03 in width, with a very flattened body of an oval form and a bright blood red color, with a band across its middle above, of a yellowish white color, occupying the two first or basal segments of its abdomen, behind which, in the centre of the back are two black spots, one behind the other. Its six legs and its beak or sucker, are of a honey-yellow color. Its antennæ are analagous to what they are in the mature insect, having four joints, the last enlarged, forming an oval knob tapering to a point at its end, the two basal joints being light yellow, and the two last ones dark brown.

These larvæ as they advance in size become darker colored and finally blackish, still showing the white band across the middle of their bodies. At length this band disappears, and the insect becomes a pupa. It is now much like the perfect insect in its form and colors, except that it is destitute of the white wings upon its back, having in place of them an oval black scale upon each side of the base of the abdomen. The edges of the abdomen in the pupa are also of a dull pale yellow color. So late as the fore part of October I met with several of these insects still in their pupa state, and some of these I do not doubt, would pass the winter in that state, and therefore would not deposit their eggs until the following spring.

The females of this species are tenfold more numerous than the males. The magnified illustration, plate 4, fig. 2 *a*, shows all parts of the insect so distinctly and exact that no description of it is necessary, beyond what is given in Dr. Le Baron's account. It may be observed that the hind edge of the thorax is of the same deep honey-yellow color with the legs, the beak, and the base of the antennæ, all the rest of the body and the antennæ being coal-black and clothed with fine erect hairs, except the wing-covers which are snow white. The anterior end of the thorax is not so full and broad as represented in the figure, and extending across the thorax rather back of its middle is a transverse depression, much more deep and distinct in some individuals than in others.

This species presents several VARIETIES. On a comparison of numerous specimens the following will be readily distinguished:

a, *immarginatus*. Basal margin of the thorax not edged with yellowish. Common.

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b, ***dimidiatus***. Basal half of the thorax deep velvety black, anterior half grayish. Common.
c, ***fulvivenosus***. The stripes on the wing covers tawny yellow instead of black.
d, ***albivenosus***. Wing covers white, without any black marks except the marginal spot. A male.
e, ***apterus***. Wingless and the wing covers much shorter than the abdomen.
f, ***basalis***. Basal joint of the antennæ dusky and darker than the second.
g, ***nigricornis***. Two first joints of the antennæ blackish.
h, ***femoratus***. Legs pale livid yellow, the thighs tawny red. Common.
i, ***rufipedis***. Legs dark tawny red or reddish brown.

As will be seen from the historical notices which are given above, this insect was at first called the Hessian fly or Hessian bug, in Carolina. And as appears from the description given by Kirby and Spence, it was only the red larvæ of these insects which were then supposed to be the depredators, no one being aware that the black bugs with white wing covers were the same insects in a more advanced state. As these larvæ have a close resemblance to the common bed-bug (*Cimex lectularius*, Linnæus) which through the Southern states is everywhere designated by its name in the Spanish language *chinche*,* when it was ascertained that they were a very different insect from the Hessian fly of New York, they were definitely distinguished by the name chinch bug, or chinch bug fly. It is altogether probable, however, that the latter was the term by which the winged insects were designated, and that the former was the name given to the larvæ; and Kirby and Spence might well be at a loss to understand why the epithet "fly" should be given to an insect without wings, as this was represented to be. The name chinch bug has now become the established title of this insect, and as the same word has been adopted as a specific name in Natural History (e. g. *Argas chinche*, Gervais) it would be the most appropriate scientific designation for this species, had it not already received a different one.

The chinch bug was first scientifically named and described by Mr. Say, in a pamphlet (page 14) entitled "Descriptions of New Species of Heteropterous Hemiptera of North America," published at New Harmony, Indiana—the eight first pages of which appeared in the year 1831, the remainder the following year. This insect must have been much more rare throughout our

* For full philological information respecting this word and its use at the South I am under obligations to W. F. Brand, Esq. of Emerton, Maryland.

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country thirty years ago than it is at present, for Mr. Say had only met with a single specimen of it, an individual of our Variety *dimidiatus*, which he found on the eastern shore of Virginia, and he was wholly unaware of its importance in an economical aspect. He named it *Lygæus leucopterus* or the white-winged Lygæus. This genus now forms the Family *Lygæidæ*, and is chiefly characterised by having the scutel or triangular piece between the base of the wings short and not reaching the middle of the abdomen, the antennæ inserted upon or below a line drawn from the eyes to the base of the beak, four-jointed with the last joint thickest or at least not more slender than the preceding one, and the thin membrane at the end of the wing covers with not more than four or five veins.

At the date when Mr. Say described this insect, M. Serville had proposed separating those species of the old genus Lygæus in which the anterior thighs are swelled or thickened, into a distinct genus which he named *Pachymerus*. But as this name had anteriorly been applied by Latreille to another genus of insects, it became necessary to alter it; and Mr. Say therefore proposed abbreviating it to the name *Pamerus*, under which name he placed nine of the nineteen new species which he described in this family. The European naturalists have probably been unaware of this correction made by Mr. Say, and the following year M. De Laporte proposed to substitute the name *Aphanus* for that of Pachymerus. But M. Guerin had anteriorly given the badly constructed name *Aphæna* to another genus of insects, the orthography of which, when it came to be rectified, became Aphanus. As this name, therefore, could not be retained, Mr. Curtis proposed the name *Rhyparochromus* for these insects, which name has been adopted by M. Serville and the European naturalists generally. But the rule of priority will certainly give Mr. Say's name, Pamerus, the precedence of Rhyparochromus. It may be objected to this name, however, that it is a hybrid, not being regularly constructed nor yet a purely fantastic name. Yet under the circumstances, it appears to us it was more judicious and serviceable to the science thus to alter a name which had become current, than to abolish it and introduce a new one.

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What has been stated will serve to give the common reader some view of the embarrasments often encountered in this vast science, in arriving at the correct designation for an insect. Especially in this country do we experience such embarrasments and are obliged in many instances to remain in doubt and uncertainty, from being unable to find in any of our public libraries those authorities a reference to which is indispensible for obtaining the information we desire.

The pamphlet of Mr. Say in which this insect is described is out of print and very scarce. Dr. Le Baron not having seen it suggested the name *Rhyparochromus devastator* as being an appropriate one for this insect. Although all the thighs are slightly thickened in this species, the anterior ones are not obviously more enlarged than the others, and are not sufficiently inflated to place it in the genus to which Dr. Le Baron assigns it, in which there is a striking contrast between the anterior and the four slender posterior thighs. In more than two dozen species of this genus which are now before me, this contrast is very plain and evident in every instance. Mr. Say therefore was clearly correct in referring this insect to the genus Lygæus and not to his genus Pamerus, which, as we have seen above, is synonymous with Rhyparochromus.

This group of insects has been subdivided into quite a number of genera since Mr. Say's day, and the present species now pertains to the genus *Micropus*, a name meaning small footed or short legged, proposed by M. Spinola in his Essay upon the insects of this order, published in 1840, page 218. I announced this fact a year since in the Country Gentleman (vol. v, p. 396) in reply to the enquiry of E. C. Smith, asking the correct name of this insect. A communication appeared in the same periodical soon after (vol. vi, p. 106), stating among other things, that the genus Micropus had not been recognized by some of the standard writers upon this order of insects, and that "Herrick Schaffer would have placed the chinch bug, had it been known to him, in the genus Pachymerus"—the same genus in which, as we have seen above, Mr. Say long ago determined it did not belong! I deem it unnecessary further to notice an anonymous

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writer, who is aiming to appear very erudite upon a theme on which he unwittingly betrays himself to be very ignorant.

Another species of *Micropus*, named *falicus* by Mr. Say, who discovered it in Missouri, I found common in northern Illinois in October, and I have also met with specimens of it in New Jersey in the month of May, though it has not yet occurred to my notice in the State of New-York. Whether it partakes of the injurious habits of the chinch bug I know not. It may be called the Black-veined Micropus, its wing-covers being dull white with black longitudinal stripes, following the veins to their tips. It is longer and also narrower than the chinch bug, being of a long linear form, 0.20 in length by scarcely 0.05 in width. It is black with the base of the thorax and the legs yellow.

The BLACK-VEINED MICROPUS has the base of the thorax elevated and smooth, forward of which is a transverse wide shallow depression, and forward of this is a slight elevation with a short wide longitudinal impression in its middle. The wing covers and wings reach only to the anterior edge of the last segment of the abdomen, and are frequently shorter with the wings wanting or merely rudimentary.

Its *pupa* is dull yellow, except the antennæ, which are black, with short fine hairs, and are rather shorter and more thick than in the mature insect. Along the back it often shows two rows of black punctures, one situated upon each side of the middle of each segment.

Another insect which may frequently be met with upon the same flowers and leaves with the chinch bug, in Illinois and Wisconsin, from the fore part of July until the close of the season, so exactly resembles this culprit that no one would suspect its being different unless apprised of the fact. Indeed it is only by a very close inspection that the one can be distinguished from the other. In one instance this has been sent me as the chinch bug; my correspondent, as I suppose, on finishing his communication, happening to meet with this, immediately inclosed it in his letter, without a suspicion that it could be anything else than the insect of which he had been writing. It however is but little more than half the size of the chinch bug, is destitute of hairs, its surface being smooth and shining, and the thin membranous posterior part of the wing covers are without any distinctly traced veins. Though belonging to the same family it pertains to a different genus, named from the circum-

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stance of the species being mostly found upon flowers, *Anthocoris* or flower-bug.

The FALSE CHINCH BUG, *Anthocoris pseudo-chinche*, is but 0.08 in length, and is black, smooth and shining, with its antennæ, feet and four anterior shanks and knees pale dull yellow. Its wing covers are white, tinged anteriorly with yellowish, with a large triangular black spot across their middle, occupying the whole posterior part of the thick coriaceous portion, this spot being brownish on its anterior edge. The thorax has an impressed line or groove across its middle. The thin membranous part of the wing covers is somewhat transparent and clear, but a variety (which may be named *semiclarus*) occurs, in which its posterior half is perceptibly tinged with smoky. This species is closely related to the European species *minutus* Linn., and *nigrella* Zetterstedt, but is readily distinguished by the colors of its legs, not to mention other characters. Identical as so many of our American species of this order certainly are with those of Europe, it is possible that this species has been described by some author whose work I have not seen. Another small species resembling this in many points, the *Xylocoris domesticus* Hahn, appears to be as common upon this side of the Atlantic as it is in Europe, as is also the variety of this species, named *dimidiata* by Spinola and *Parisiensis* by Amyot and Serville.

This insect, so far as we yet know, is exempt from any molestation by predaceous insects and other animals. No bird probably has a relish for such an unsavory morsel as one of these fetid chinch bugs. And this is undoubtedly one of the chief reasons why no check is given to its multiplication, and when one or two favorable seasons arrive, it is able to increase with a rapidity and to an extent which has few parallels among the insect races.

Nor has any mode for destroying this insect or preventing its depredations, been discovered, of such efficacy as to bring it into public notice and favor. When they are migrating from one field into another, it is reported that they have been arrested by digging a trench before them, up the crumbling dirt of the sides of which, they are unable to climb; and when the whole colony is thus imprisoned, they have been covered with straw and burned. By burning the dry leaves of the forest in places where they have settled in numbers, multitudes have been destroyed. A subscriber to the Southern Planter (vol. xv, p. 275), says he knows that strong soap suds will kill them, when on corn, if a half gill or gill be poured upon each stalk—a labor not half so great as a single hoeing of the crop is. When this insect became so numerous in North Carolina, in 1839, Mr. J. W. Jeffreys proposed that the farmers and planters should all abandon the sowing of wheat for two or three years, he deeming this the only measure

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by which it was possible to subdue it. Dr. Le Baron thinks it improbable that any remedy can ever be discovered whereby to prevent its devastations. My own belief is very different. I do not think Providence has sent any injurious insect into our world, but that when we come to study its history and habits, and become fully acquainted with its economy, we can discover some point where it is assailable, and human ingenuity will be able to devise methods by which it will be practicable, either to destroy the insect, or to shield the vegetation on which it preys, from its depredations. Though often, no doubt, much patient investigation and many experiments conducted by different persons will be necessary, before we can arrive at the most certain and successful remedies.

As regards the chinch bug, if the facts reported are true, we think they point us to a feasible mode for subduing it. They indicate that moisture is most uncongenial to this insect. If, when it is overruning the land in myriads, a wet season arrives, it is at once quelled in its career. Mr. Williams speaks of its ravages as having been perceptibly checked by a single heavy rain. And it appears from the statement of Mr. Albert Burnet that so slight a circumstance as the dew evaporating before the morning sun, first upon the south and east sides of a field, often causes it to congregate upon those sides of the field exclusively. In view of these facts it would seem that by drenching that part of a field in which these insects are clustered, with water, by means of a fire or a garden engine, they may be washed from the plants and destroyed. Though it will be a formidable task to shower a large wheat field profusely, yet if the crop can hereby be saved from ruin, it will amply repay the expense. But commonly it is only a narrow strip upon one side of the field which will require this operation. And where there is a brook or stream of water passing through or adjacent to a wheat field, this measure can certainly be resorted to, repeatedly should it be necessary, at no great cost. When the small red bugs, the tender young larvæ of these insects, have made their appearance and are clustered about the roots of the wheat plants, in the month of June, they can probably be more easily destroyed, than at any subsequent stage of their lives. And it is earnestly to be

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hoped that some one who is conveniently situated for testing the efficacy of this measure, will do so, and make the result known to the public.

Burrowing in different parts of the stalks, rendering them dwarfish and often causing the heads to perish; small, slender, pale-green and watery-white shining maggots.

The larvæ of several small WHEAT FLIES and BARLEY FLIES of the genera *Chlorops*, (plate 1, fig. 4), and *Oscinis* (plate 1, fig. 5).

In Europe it has long been known that among the worst depredators upon the grain crops there, are the larvæ of several small flies belonging to the genera *Chlorops* and *Oscinis*. Some of these attack the young plants, and taking their station slightly above the root destroy the central stalk. Others burrow in the stalk or straw, and others infest the heads. Thus every part of the plant finds an enemy in one species and another of this group of insects. And so seriously do they injure the crops on which they prey, that Linnæus a century ago computed the loss occasioned by one of them (*Chlorops Frit*), which infests the heads of barley in Sweden, to amount to nearly half a million of dollars annually.

It has not hitherto been known that the wheat in this country was attacked by any insects of this kind. But I have the present season discovered these small flies in abundance, in every wheat field in my neighborhood. On sweeping with a net anywhere among growing wheat, a multitude of them will be gathered. They are of several different kinds and all appear to be of species distinct from those described in the works of Macquart, Zetterstedt, and other European writers to which I am able to refer. And upon examining the wheat stalks at different times during the season, the larvæ of one and another of these flies are found therein—smooth, shining, footless little maggots, of pale green and watery-white colors, commonly imbedded in the straw in small burrows or cylindrical channels which they have excavated.

As these flies appear to be native species, it is probable that before wheat was cultivated upon this continent they sustained

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themselves upon some of our wild grasses. Their numbers must therefore have been very limited at that period. But when wheat was introduced and became extensively cultivated, it gave them such an ample supply of most palatable nourishment that they have gradually increased and are now excessively numerous all over our land, laying every wheat field under contribution for their support. And I doubt not it is from the numbers of these and other insect depredators which abound upon our wheat, that we are no longer able to produce such crops of this grain as were uniformly harvested formerly, when our lands were newly cleared. How is it possible for wheat to grow with any thriftness when it is incessantly assailed by such hosts of these enemies, bleeding it at every pore? And if any mode could be discovered by which our wheat could be protected from these depredators, I do not doubt that on our old lands which have been under cultivation a century, we could now, with our improved methods of tillage, rear crops of this grain, surpassing those which grew upon the same lands when they were newly cleared. And if wheat could thus be grown, the intrinsic worth and the market value of lands in the old settled sections of our state would be advanced probably one-half.

At the time of placing the specimens from which the accompanying illustrations were taken, in the hands of the draughtsman, I supposed I should obtain some one or more of the larvæ of these insects, in its perfect state, and thus be able to present its history with some approximation to completeness, in the present report. But my efforts to rear them have been unsuccessful. And it will scarcely be worth while to state the situation in which one and another of these worms is found, and the manner in which it mines or otherwise injures the straw, until the particular species by which the mischief is done in each case, can be identified and named. For the present, therefore, I merely state what will serve to explain the accompanying figures, and give the reader some acquaintance with this group of flies as they appear upon the wheat in their perfect state.

These flies form a particular tribe or sub-family, named the Oscinides, the members of which may be distinguished from

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those of the other groups of the extensive Family MUSCIDÆ in the Order DIPTERA, by their small size, by having the last joint of their antennæ globular insead of oval or oblong; by being destitute of winglets, those small scale-like appendages which occur at the base of the wings, having some resemblance in their shape to the bowl of a spoon; and the veins and veinlets of the wings being as they are represented in the accompanying figures.

One of the prettiest of the flies of this group, which we meet with upon growing wheat the latter part of June, pertains to the genus *Meromyza*, which is readily known from the other genera, by having the thighs of the hind pair of legs thick and appearing as though they were swelled. It is very similar to the European M. *saltatrix* Linn., but is larger, the stripes on its thorax are deeper black than those upon its abdomen, and here it is the latter stripes which are united or confluent at their ends and not the former. It may be named

The AMERICAN MEROMYZA, *M. Americana*. It is 0.17 in length to the tip of its abdomen, and 0.20 to the end of its wings. It is yellowish white with a black spot on the top of its head, which is continued backward to the pedicel of the neck. Thorax with three broad black stripes, approaching each other anteriorly but not coming in contact, the middle stripe prolonged anteriorly to the pedicel of the neck and posteriorly to the apex of the scutel. Abdomen with three broad blackish stripes, which are confluent posteriorly and interrupted at each of the sutures. Tips of the feet and veins of the hyaline wings blackish. Eyes bright green. Antennæ dusky on their upper side.

Another minute pretty fly, often found with the preceding upon wheat, and resembling it in its colors, is generically distinguished from it by its short, thick body, its abdomen, when distended by a recent meal, being perfectly spherical and abruptly drawn out at its tip into a conical point. The second veinlet of its wings, moreover, is very oblique instead of being transverse as in all the other genera of this group. It thus belongs to Macquart's genus *Siphonella*, and the present species may be named in allusion to its plumpness

The OBESE SIPHONELLA, *S. obesa*. It measures only 0.09 in length, to the tip of its abdomen and 0.12 to the end of its wings. It is black and polished, with a slender stripe on the middle of the thorax, the scutel and the under side of the body bright sulphur yellow, the abdomen having a tinge of green beneath. Legs bright tawny yellow. Head yellowish white. Antennæ tawny yellow, their tips black. Two dots on the anterior edge of the mouth, a large egg-shaped spot on the crown, two short stripes low down on each side of the breast, and the anterior pair of feet, black.

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In the *genus Chlorops*, as the name will indicate to those who are acquainted with the Greek language, the eyes are green. They might hence be popularly named the green-eyed wheat-flies. But as their scientific name Chlorops will be a more definite and convenient designation it will be better to adopt it as the popular name of these flies. Their bodies are commonly of a yellow color, varied more or less with black in the different species. One of these species was so abundant the latter part of June that at almost every step in any of our wheat fields a dozen or more of them could be seen. It may therefore be termed

The COMMON CHLOROPS, *C. vulgaris*, (plate 1, fig. 4, the short line to the left of the figure indicating the natural length.) It measures 0.15 or a little less to the end of its abdomen and from 0.18 to 0.20 to the end of its wings. It is of a pale tawny yellow color, with a round black spot on the top of its head, and the tips of its antennæ and of its feelers are also black. It has two black bristles at the end of the middle shanks, and one at the end of the forward ones, and rows of black bristles upon the thorax. On the top of the head (fig. 4 *a*) are two pairs of bristles inclining backward and two pairs inclining forward, the anterior pair of the latter being shorter. The abdomen is oval, and in its normal state is of the same color with the thorax; but from inclosed alimentary matter it becomes variously discolored, often showing obscure brown or reddish spots.

The FEATHER-HORNED CHLOROPS, *C. antennalis*, is the same size as the preceding, but with the abdomen commonly shorter. It is pale yellowish varied with tawny and is whitish beneath. The antennæ are pale orange, their tips black, and the bristle which arises from them, and which is simple in the other species, is here feathered or plumose. On the top of the head is a black spot and the feelers are also black. It is also clothed above with black bristles. The abdomen when distended with aliment is broad oval and of a dull livid or pale brown color, with the sutures whitish.

The genus *Oscinis* is distinguished from Chlorops by having the coarse vein which forms the outer edge of the wing prolonged around the tip of the wing to the end of the inner of the two middle veins of the wing, at which point this marginal vein abruptly becomes slender, (see plate 1, fig. 5); whereas in the genus Chlorops it is at the end of the outer middle vein that this thick robust marginal vein terminates, (see fig. 4 of the same plate). The species of Oscinis are further distinguished from those of Chlorops by being of a smaller size and of black instead of yellow colors. Several species of both these genera, in addition to those here presented were met with upon wheat, but I defer a description of them to a future occasion.

The SHANK-BANDED OSCINIS, *O. tibialis*, (plate 1, fig. 5) is 0.08 in length to the tip of its abdomen and 0.11 to the end of its wings. It is black, polished and shining, its shanks and feet being pale dull yellow, the hind shanks having a broad

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black band towards their bases (as shown in the separate illustration of the leg, fig. 5 *a*), and the middle ones having a narrower faint blackish one; the tips of the feet being also black. Bristle of the antennæ black. A slight transverse tawny yellow line above the base of each antennæ. The two veinlets of the wings are distant from each other thrice the length of the second or outer veinlet.

Two of these flies were enclosed in a vial when captured. Adhering to one of them was a small bright red mite, which is parasitic upon these flies. This fly died in about three hours, the other remaining brisk and lively twelve hours afterwards, when it was removed for examination.

The YELLOW-HIPPED OSCINIS, *O. coxendix*, is 0.07 in length to the tip of its abdomen, and 0.10 to the end of its wings. It is black with a white face and buff yellow front shaded to blackish on the crown, where is a polished deep black semicircular mark, its concave side facing backward. Its anterior hips are testaceous yellow. The veinlets are less than twice the length of the second from each other.

The THICK-LEGGED OSCINIS, *O. crassifemoris*, is the same size with the last, and is black with a white head and the thorax with a gray reflection. The last joint of the antennæ with its bristle is black. The legs are pale yellow, the tips of the feet black. The veinlets are so near each other that they are almost united. In the female the abdomen is egg-shaped and polished, its apex drawn out into a long sharp-pointed ovipositor. The middle and anterior thighs are rather short and thick, the hind ones longer and cylindrical.

The fly figured, plate 1, fig. 3, is a much larger species pertaining to another group. It occurs in abundance upon the heads of wheat the latter part of June. This is the species which was currently regarded in the circle of my acquaintance as being the fly from which the little yellow maggots, the larvæ of the wheat midge, proceeded, until I came to investigate this subject, and discovered in our country the real culprit (*Cecidomyia Tritici*) described by Mr. Kirby. As I have had occasion repeatedly to allude to this popular mistake, and this fly has received no name, as I have been able to discover, by which it may be specified, I here present a name and description of it, and also of another common species closely related to it. I as yet know nothing of their habits, beyond the fact that they are both numerous, hovering over and alighting upon the heads of wheat at the time they are in flower.

The DECEIVING WHEAT FLY, *Hylemyia deceptiva*, is a quarter of an inch in length to the tip of its wings. It is ash gray, with black legs, antennæ and feelers. Abdomen with a row of longditudinal brown-black spots forming an interupted stripe along its middle. Thorax in a particular reflection of the light showing a brown stripe anteriorly and on each side of it a brown spot. A tawny yellow spot upon the front, more conspicuous in the females, and passing into a black stripe upon the top of the head.

The SIMILAR WHEAT FLY, *Hymelyia similis*, resembles the preceding, but is a size smaller, measuring 0.22 in length, and of a paler shade of ash gray, with the tawny yellow spot upon the front replaced by black, and is destitute of the brown stripe and spots upon the thorax.

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Myriads of small pale maggots crawling from the mow of wheat soon after it is placed in the barn; the kernels of grain shrivelled and dwarfish.
The WHEAT MOW FLY, *Agromyza Tritici*, new species (Plate 2, fig. 1).

Several years ago a farmer in my neighborhood, soon after gathering his wheat into the barn, found countless myriads of small worms were crawling out of it, literally covering the mow of grain and wandering away from it to every part of the barn. These worms it is evident had just now completed their growth and were crawling about in search of the moist earth, wherein to bury themselves, to repose during their pupa state. It would seem that some cause had made them later than usual in reaching maturity; and had the wheat remained in the field a few days longer, they would have escaped from it there, so generally that no notice of them would have been taken, and the fact would never have been known that such an army of insects had had their subsistence upon this crop.

Alarmed with the numbers of these worms, and fearing they would perhaps wholly destroy the mow of grain, the proprietor had the whole of it threshed immediately. I happened to visit the barn as the threshed grain was being winnowed, when the above facts were communicated to me. The heap of uncleaned grain was literally alive with these worms and the cracks in the floor were filled with them. The kernels of wheat appeared to be shrunk in the same manner as when they have been infested with the wheat midge. I put a number of these worms into a small box, with some of the chaff and grain. Other engagements diverted my attention from this subject and it was wholly forgotten until many months afterwards, when, happening to open the box, I found in it quite a number of small flies, which had completed their transformations and perished in their confinement. It therefore appears that it is by no means essential to these worms to bury themselves in the moist earth, though that is doubtless their natural habit. But if they can find any crevice in the dry barn where they can stow themselves and lie undisturbed, it is all they require in order to complete their transformations.

The worms, according to my recollection, were much like the little yellow maggots of the wheat midge, but were of a dull

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white color, and rather larger. Their transformations are like those of flies generally, the outer skin of the larva or maggot contracting and becoming dry and hard, and forming the case within which the insect lies in its pupa state. When the larva skin of this species is thus dried, with the pupa reposing within it, it appears as represented, plate 2, fig. 2, 2 *a* being a highly magnified view of its upper and 2 *b* of its under side. It is but the tenth of an inch long, and 0.03 in diameter; it is shining and of a pale yellow color, of an oval or rather an elliptical form, more rounded at the head and pointed at the opposite end, the segments distinctly marked by transverse constrictions.

These flies appear much like the common house fly, reduced to an infantile size. I supposed they would prove to be one of the European species of Oscinis, until I came to examine them, when I found that, though they belong to the group OSCINIDES, they are generically distinct from both Chlorops and Oscinis, in having bristles or hairs upon the face as well as upon the crown, and in having the two little transverse veinlets of the wings sitaated quite near the base. They thus pertain to the genus *Agromyza* a name meaning field flies, as this genus is characterised by Macquart, and to his section AAA, and to his subsection DDD, but they are clearly distinct from either of the species which he describes; nor am I aware that any of the members of this extensive genus have hitherto been noticed as depredators upon wheat, like their kindred of the genera Chlorops and Oscinis. The present species may therefore be designated

The WHEAT MOW FLY, *Agromyza Tritici*, (plate 2, fig. 1.) It is 0.08 in length, and to the tip of the closed wings 0.11. It is black, with a broad pale reddish yellow band upon the front above the base of the antennæ, and the mouth broadly margined with dull yellow. The legs are brownish black, the knees slightly marked with pale yellow. The wings are notched on their outer margin near the base, at the apex of the first vein. The veinlets are situated near the base of the wing and near each other; and the inner middle vein is not prolonged beyond the second veinlet.

In the same box in which these flies were hatched was found four individuals of a parasitic fly which had evidently come from some of the worms of the wheat mow fly. They pertain to the Family PROCTOTRUPIDÆ of the Order HYMENOPTERA, and to the genus *Diapria*. They may therefore be named

The WHEAT MOW FLY'S PARASITE, *Diapria Agromyzæ*. They measure 0.06 in length, and to the tip of the closed wings 0.08. They are black and shining, with shanks

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thickened towards their tips, the hind pair being very long, and the legs are pale yellowish, with the thighs and the thickened ends of the shanks black. The abdomen is elliptic. The antennæ in the males are thread-like and nearly as long as the body, composed of fourteen joints, which are very distinct, equal, oval, a third longer than broad, the apical one being a little longer and egg-shaped, and the basal one club-shaped and thrice as long but scarcely thicker than the following ones. In the female they are shorter and composed of twelve joints which are compacted together. the three last enlarged and forming a kind of knob or club, the last joint nearly as long as the two which precede it, its end bluntly rounded.

Upon the heads and stalks in June and July, exhausting the juices of the kernels and rendering them dwarfish and shrivelled; exceedingly minute, active, long and narrow, six-legged insects, of a bright yellow or of a shining black color.

The WHEAT THRIPS, *Thrips Tritici*, new species.
The THREE-BANDED THRIPS, *Coleothrips trifasciata*, new species.

My attention has been called to these insects by a letter from David Williams, dated Geneva, Wisconsin, July 9th, 1855, which says: "Enclosed I send you specimens of a minute little insect that is causing some alarm in this vicinity. They are found in all blossoms in great numbers. They first made their appearance about the middle of June, or at least they were then first noticed, so far as I have heard. For about two weeks they were found in the blossoms of wheat and of clover, causing numbers of the blossoms to wither, and in some cases the kernel was also attacked. About a fortnight ago we had a very heavy fall of rain, which appeared to destroy them; but within a few days I have noticed their reappearance in countless numbers. They are very nimble, requiring good eyes and ready fingers to secure them, and I was obliged mainly to my wife for the capture of those which I send you."

The insects alluded to in the above extract are so minute, that had only two or three specimens been sent me, I should have been unable to give any definite account of their species. An acknowledgment is due Mrs. Williams for the number of these insects which she enclosed in the quill—a task which the bungling fingers of a man could scarcely have accomplished. Among them I find specimens in all the stages of their growth, and am hence able to present a tolerably complete history and description of the species; although it is only from living specimens that such

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minute objects can be satisfactorily studied, and described with that precision and fullness which science requires.

Insects of the kind to which these belong may be distinguished from all others by their wings (see the accompanying figure, *e*), which are long, narrow and strap-like, and in most of the species are fringed on both sides with long hairs like eye-lashes. Their mouths are also different from those of all other insects, being nearly intermediate between the *beak* or bill with which some of the orders of insects puncture and *suck* the fluids on which they subsist, and the *jaws* with which all the other orders *gnaw* the substances on which they feed. These insects originally formed the genus *Thrips*, placed by Linnæus next to the plant-lice, in the Order HEMIPTERA. But as their wings and the structure of their mouths is so wholly unlike that of any other insect, naturalists of late rank them as a distinct order, which is named THYSANOPTERA, i. e. fringe-winged. This order contains the single family THRIPIDIDÆ (currently written Thripidæ by authors, but incorrectly), which is divided into seven genera by Mr. Haliday, whose researches in this group have been unsurpassed. About fifty species of these insects are known to the entomologists of Europe. They are all of small size, more than half of them being only about the twentieth of an inch in length, or less, and but few slightly exceed the tenth of an inch; though recently some have been found in Australia which are three times as large as any which were previously known.

Most of the species are found in the flowers of different plants. They feed upon the juices, and are very injurious, especially in hot-houses, causing small dead spots upon the leaves and flowers wherever they wound them. Some of them also infest melons and cucumbers. One species is very injurious to the olive trees in Italy. Another attacks peaches and other fruit to a mischievous extent. But the species which appears to do the greatest amount of damage is the grain Thrips (*T. cerealium*). Our first accounts of this insect are from Mr. Kirby, in 1796 (Linnæn Transactions, iii, 246), who however supposed it to be the *Thrips physapus* of Linnæus, until Mr. Haliday showed it to be distinct from that species. An excellent history of this

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species is published by Mr. Curtis in his paper on insects affecting the corn crops, in the Journal of the Royal Agricultural Society, vol. vi, p. 499; and figures of the insect and its dissected parts, in the several stages of its growth, from Mr. Haliday's manuscripts, are given in the list of Homopterous insects in the British Museum, part iv, plates vi, vii and viii. In the year 1805, one-third of the wheat crop in the province of Piedmont is said to have been destroyed by this seemingly insignificant little insect. Mr. Kirby says it is by far the most numerous of any insect upon the wheat in England; he does not think he ever examined an ear of wheat without meeting with it. He says it takes its station in the longitudinal furrow of the seed, in the bottom of which it seems to fix its beak, and probably sucks the milky juice which swells the grain. Thus by depriving the kernel of part, and in some cases perhaps the whole of its moisture, it causes it to shrink up and become what the farmers call "pungled." According to Vassali Eandi, it also gnaws the young stalks just above the knots, causing the ear to become abortive in consequence of these wounds. It is late sown wheat which is reported to be chiefly injured by this insect; and early sowing is the only remedy which I find spoken of by those who have written upon it.

Our American species of this order of insects are probably as numerous as those of Europe, but none of them have been examined and described, except one which occurs in small hollows gnawed in young apples, of which some account was given in my last report. I have repeatedly noticed different kinds of these insects upon growing wheat in the State of New-York, but not in such numbers that I supposed they were doing any appreciable injury to the crop. One of these species is very similar to the *Phlæothrips Statices*, Haliday, which in Europe occurs in myriads upon the flowers of the Thrift (*Statice Armeria* Lin.) That which I have met with most common, upon wheat in my own vicinity is the Three-banded Thrips, hereafter described. Dr. Harris has also seen the larva of a Thrips (Treatise, p. 205) which he supposes to be the *T. cerealium*. He merely states that it was orange-colored; and as the larva of *T. cerealium* has a black or dusky head and two spots of the same color on the fore part of the thorax, and its antennæ and legs have alternate

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blackish and whitish rings, it is more probable that his specimens were the same which I now have before me from Wisconsin. Be this as it may, the communication from Mr. Williams is important, as making us acquainted with an enemy of the wheat crop of which we heretofore have had no definite knowledge, and which will undoubtedly at times be quite detrimental in the wheat-growing districts of our country.

Although this species, like many others in this order, occurs upon the flowers of different plants, it is upon wheat, in all probability, that it will be oftenest noticed, and to which it will prove most injurious. It may therefore appropriately be named the WHEAT THRIPS, *T. Tritici.*

Attached to the surface of the shrivelled flower-leaves in the quill in which these insects were sent me, I meet with what I doubt not are their *eggs* (see figure *a*, next page,) deposited probably by one of the females after being imprisoned. They are so minute as to be wholly invisible to the naked eye, except when placed upon clean white paper, when they can be merely discerned, appearing like an atom of dark colored dust. Under the magnifier they are discovered to be of a bright red color, like particles of sealing-wax, and of an oval almost globular form; and they are attached to the leaf by a short, thick, crinkled stalk or stem, which is of a dull white color.

The *larvæ* (fig. *b*) resemble the perfect insects, except that they are wholly destitute of wings and are smaller and softer, with the several segments of the body more equally and distinctly separated from each other by transverse, constricted lines. They are throughout of a bright orange-yellow color, of the same hue as the worms of the Wheat-midge, which worms, however, small as they are, appear like giants when placed by the side of these larvæ.

Two minute black dots upon the anterior end of the head are the eyes. The head is square and but half as broad as the second segment, which is broadest at its base, narrowing forward to its apex, where it is of the same width as the head. The third and fourth segments are slightly longer and wider than the second, and much longer than the following ones, which are about equal to each other, the apical one being narrowed, of a tubular conic form and two-jointed. The body is quite convex above and beneath. The legs and antennæ are much like those of the perfect insects, except that they are shorter. The two minute joints at the end of the antennæ (see figure *f*) can commonly be perceived in the larva state of these organs.

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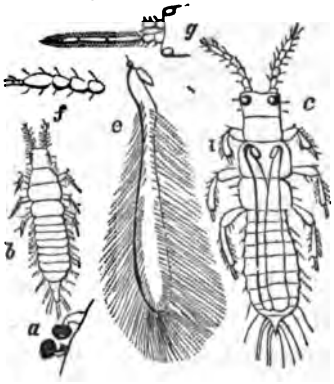
During their larva state the insects of this order are very nimble, skipping and throwing themselves to a distance by striking their abdomen suddenly against the surface upon which they are placed. In their pupa state they are much more slow and sluggish in their motions, and become quite active again when they reach their perfect state.

The *pupæ* are like the perfect insects in size and shape, except that their wings are short or rudimentary. At first they are merely oval scales, situated upon each side of the two last segments of the thorax. Subsequently they become more developed so that they reach to the middle of the abdomen or slightly beyond, but they are still incapable of being used for flying. The species under consideration, when in its pupa state, is of the same yellow color as when a larva, but the abdomen, at least towards its base, is paler than the thorax.

The *perfect insect* (figure *c*) is but four hundredths of an inch (0.04) in length. Its length is indicated by the short line near the left forward leg in the cut. It is thus a fourth smaller than *Thrips cerealium*, and instead of being black like that species, this retains the yellow color which it has when a larva, the head and thorax (which includes the three large segments next to the head, from each of which a pair of legs arises, as shown in the figure) being of a deep orange yellow, or like the yolk of an egg, whilst the abdomen is paler, and the legs are yellowish white. The antennæ (the apical joints of which are represented more enlarged at *f*) are whitish, tinged towards their tips with dusky. The fringes of the wings are also dusky. The fore legs are shorter but no thicker than the others. All the other details of its structure are so distinctly represented in the figure, that a particular description is unnecessary.



The species which I have noticed as the most common upon wheat in Washington county, New-York, may be named the THREE-BANDED THRIPS (*Coleothrips trifasciata*). It is clearly distinct from the three European species included in this genus, though nearly related to the *C. fasciata*, Lin. It is nearly double the size of the wheat Thrips, being 0.07 in length, and is so distinctly marked that even our preserved specimens can be readily discriminated. It is of a black color, polished and shining, with the third joint of its antennæ white, and its wings black or dark

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smoky brown, with three broad white bands, whereof one is upon the base, another across the middle, and the third, which is somewhat narrower, upon the tip. The wings show two longitudinal veins, but no transverse ones were noticed upon them, nor could I discover any fringe upon either their outer or inner margin. The fore legs are larger than the others, and the antennæ (see figure *g* of the preceeding cut, representing the head, eyes, left antenna and base of the right) instead of arising far apart as in most of the species I have examined, come out from the front of the head close together, and are composed of only five principal joints, of which the two first are short, and a third thicker than the others, which are long and cylindrical, the last one gradually tapering to a slender point, its apical portion being divided into small indistinct segments.

This species is common upon wheat as early as the first of June. When the grain ripens it probably forsakes it and becomes dispersed upon plants which flower later in the season; for I have met with it upon flowers of tanzy (*Tanacetum vulgare*) the last of July.

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2. INDIAN CORN.

AFFECTING THE STALKS.

Severing the young stalks by night at or near the surface of the ground; a thick cylindrical pale dull colored worm an inch or more in length.

Cut-worms, the larvæ of different species of *Agrotis*, (plate 3, fig. 1, 2 and 6.)

Common as the cut-worm is in all parts of our State and country, our knowledge of it is still very imperfect. I remember in my boyhood it was a subject of discussion in my neighborhood, whether if these worms were cut in two, both ends did not live, thus producing two worms where but one existed before. Though at this day I suppose no such absurd idea is anywhere entertained, yet with regard to the transformations of these worms, and their economy generally, very little authentic information is possessed. This clearly appears from the following enquiry from West Haven, Ct., July, 1855, addressed to the Albany Cultivator (third series, vol. iv, p. 115). "Will some of your readers inform us how the Cut-worm is produced—whether from the miller, or whether they bring forth their young like the rabbit or any of the animal creation? I would like to know also whether one kind of soil more than another, or whether different manures, coarse or fine, have a tendency to increase their numbers. Their name is legion with us, this season. More than thirty have been found around one cucumber hill. Whole fields of cabbages have been cut down in a night. The subject of their production has been up for discussion, but no one seems to know, nor is there any author that we have that throws any light on the subject. I have had some experience relating to their production, but it is so at varience with my previous ideas that I want more light before publishing it."

Whether the cut-worm is more numerous in one kind of soil than another, I am unable to say. The soil of my own neighborhood is a gravelly loam, and in this the cut-worm is common. I presume it is equally common in sandy and clay soils. In one instance, at the bottom of a bowl-shaped hollow, where the soil

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partook of the nature of a stiff clay, a number of cut-worms were found, when there were scarcely any in the surrounding gravelly soil; but it was probably the more juicy, tender growth of the corn in this damp hollow, which caused the worms to gather there, rather than the nature of the soil.

I do not think the fertility of the soil, or the kind of manure which is applied to it, has any influence upon these worms, except in making the plants grow more succulent, for it is vegetation of this character which appears to be their favorite food. We all know these worms are common in our highly manured gardens. And I have never found them more plenty than on one occasion among beans planted upon a hill-side, so barren that it was thought nothing else could be raised there.

The biography of these worms is briefly as follows: The parent insect drops her eggs upon the ground, the latter part of summer. These soon hatch, and the young worms which come from them crawl into the ground and feed upon the roots and tender shoots of herbaceous plants. When cold weather arrives they descend a few inches below the surface and there lie torpid during the winter, and renew their activity when spring returns. It is not until they have nearly completed their growth, in the month of June, that they show that habit which renders them so injurious, and has acquired for them their name, "cut-worm." They then crawl from the earth, by night, and with their sharp teeth cut off the young succulent plants of maize, cabbage, beans, &c., almost as smoothly as though it were done with a knife. When daylight approaches, each worm crawls into the ground again, entering it within a few inches of the plant it has severed—the newly disturbed and rough appearance of the dirt showing the exact spot where it has gone into the ground, and rendering it easy to uncover and destroy the worm. Having got its growth it forms a little oval cavity in the ground, within which it lies and changes to a pupa or chrysalis. In this state it has some resemblance to a long slim egg of a chestnut brown color, having several impressed rings or joints towards its pointed or tail end. From this pupa, in three or four weeks, hatches the perfect insect, which is a dark colored miller or moth.

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Every observing person is aware there are several kinds of these worms, differing from each other in the color of their heads, the stripes upon their bodies, and in their habits. But unfortunately we do not yet know which particular species of moth it is which either of the kinds of these worms produces. I have repeatedly endeavored to breed the moth from these worms, by placing them in cages into which I transplanted young corn, beans, &c., and also by placing bell-glasses over corn hills where worms had buried themselves. But I have never been able to succeed. The worms on finding themselves imprisoned, refuse to eat, and hurriedly crawl around and around the inner side of their prison, night after night, until they literally travel themselves to death. They are by no means such sluggish, stupid creatures as one would suppose from seeing them in the day time. By night they are as active as any other animal whose skin is stuffed and distended with food as theirs is. They are evidently able to crawl quite a distance in a single night. It is the common opinion that they are always bred in the ground near the spot where they do their mischief. But I suspect they are everywhere wandering about, nightly, in search of such tender, succulent plants as will furnish them a dainty repast, and that they thus in many instances enter our gardens and corn-fields from the surrounding enclosures. They certainly, if so inclined, could travel across the largest of our arable fields in a few hours.

The following short descriptions of the different kinds of cut-worms which have fallen under my notice, and their habits, I extract from my manuscripts. All these worms, except the White one, are about an inch and a quarter in length when at rest, and an inch and a half when crawling. They all have four polished elevated dots upon each segment, on the back, and a few others which are less distinct, upon the sides, each dot bearing an exceedingly fine hair.

The Red-headed cut-worm is of a dull pale brown color, without any stripes, and may be distinguished from all the other kinds by its head, which is of a tawny red color, instead of smoky yellowish as it is in each of the following, except the last one. Common in corn-fields, cutting off the plants slightly

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below the surface of the ground, and thus always destroying them. On Staten and Long Islands, I am told, this species is popularly named the "Tiger worm," from its destructive habits, and that the name cut-worm is there applied only to the next species.

The STRIPED CUT-WORM is dirty whitish or pale smoky, with darker brown stripes, of which there are two along the back and three broader ones along each side; dots black, as they are in the preceding species, but not so minute. This is the most common kind in corn-fields, cutting off the plants half an inch above the ground; hence the stalk frequently shoots up again, from the middle of the stump. This occasionally occurs among beans also. It buries itself but slightly, and may sometimes be found with half its back exposed, even though the sun be shining clear and hot.

The FAINTLY-LINED CUT-WORM is dull brown, with very faint pale longitudinal lines, and the polished dots but little darker than the general color. Found in cornfields, but more commonly in gardens among cabbages and sometimes among onions. Buries itself but slightly.

The WHITE CUT-WORM is smaller, being scarcely an inch long when at rest. It is dull white, with black dots and no stripes or lines except a row of very faint brownish touches along the upper part of each side. It is rare, a single individual being occasionally found among corn and beans.

The BLACK-HEADED CUT-WORM is dull dark brown, with faint traces of pale lines, and its head deep black. This is probably what is named the "Black worm" in some neighborhoods. It is the most common kind among beans, cutting them off slightly below the surface, and drawing the severed stem into the hole where it buries itself, and there feeding upon it during the day, till the whole is devoured, or only pieces of the wilted leaves remain, plugging up the entrance of the hole. Either the Striped or the Lined cut-worm frequently treats corn in this same way. Hence the stump may often be found without any wilted leaves lying near it.

There are doubtless other species of cut-worms which have not yet presented themselves to my notice, my investigations of-

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these insects being as yet far from complete. My young cucumbers being always enclosed in boxes open at the bottom and top, are never molested by cut-worms, and seldom by other insects; hence I know not the worm which depredates on them.

As already stated, the particular species of moth or miller into which either of our American cut-worms changes, has never been ascertained. Most of the species, however, pertain to the genus *Agrotis*, of the family NOCTUIDÆ, or Owlet-moths. In England the insects of this genus are named "Dart moths," from a peculiar spot or streak which many of them have near the base of their fore wings, resembling the point of a dart or spear. Much the most common species of this genus in the state of New-York, can be nothing else than the GOTHIC DART *Agrotis subgothica* of the British entomologists, (Plate 3, fig. 1). This was first described by Mr. Haworth in the year 1810, and is current in all the books as a British insect. Mr. Stephens, however, says it is very rare, only three or four specimens having been found in England. I doubt not it is an American insect, the eggs or larvæ of which have accidently been carried to England, probably in the earth in which plants have been transported thither. Here it is one of the most common of those moths which come in at the open windows of our houses on warm summer evenings, attracted by the lights of the candles. I have thus taken more than a dozen specimens in an hour. It begins to appear early in July and continues till September, and in Illinois I met with it on one of the last days of this month. Its wings when spread measure from over an inch and a quarter to an inch and a half across. It is of a grayish-brown color, and the fore wings have a broad whitish stripe on the outer margin from the base to beyond the middle, and another branching from this and running through the centre of the wing. Between these whitish stripes is a pale triangular spot having its outer side wholly confluent with the outer stripe, and back of this is a second pale spot which is kidney-shaped, the space before, between and behind these spots being black or dark brown. And extending from the base of the wing along the inner side of the inner stripe is a broad black or dark brown streak (representing the dart head

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above alluded to,) which streak is crossed by two slender pale lines, these lines not parallel with each other. This last mark with the two pale lines across it, will alone distinguish this from all our other moths.

Our next most common species is the DEVASTATING DART *Agrotis devastator*, (Plate 3, fig. 2,) thus named by Mr. Brace in the year 1819, in a short article upon the cut-worm, published in the first volume of Silliman's Journal, page 157. And it appears to be this same species, which has recently been figured and named *Agrotis Marshallana* by Mr. Westwood, from a single specimen found in England by T. Marshall, Esq., (Humphrey's British Moths, vol. i, p. 122.) In this species the wings when spread are from an inch and a half to over an inch and three-fourths across. The fore wings are grayish brown, and are crossed by four equidistant wavy whitish lines, which are edged more or less with blackish. But commonly only the last one or two of these lines can be perceived; and the last line has a row of blackish triangular spots, like arrow heads, along its anterior side, their points directed towards the base of the wing. Often these spots are so obliterated that only one or two of the middle ones can be discerned in a particular reflection of the light. But it is by these spots more than any other character that I discriminate specimens of this species; for it is variable, with its marks obscure and more or less obliterated, from its wings when flying having been fluttered and rubbed against grass, leaves, &c., as is apt to be the case with most of the insects of this order.

A third species, also very common, (Plate 3, fig. 6,) differs generically from the two preceding, and appears to coincide more closely with *Graphiphora* than with any other genus characterised by European writers. It is named the CLANDESTINE OWLET-MOTH, *Noctua clandestina*, by Dr. Harris. It is of an obscure brown or gray color, its wings when most perfect marked as represented in the figure. Our illustrations of these three species are quite exact, and will give the reader a much clearer view of the complicated markings of their wings than he can obtain from any written description.

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The insect figured in Dr. Emmons' volume, plate 45, fig. 2 and mentioned in the text as being a common species of Agrotis, is the *Hadena amica* of Stephens.

Although more than a dozen other species of Dart-moths are known to me, those now described will suffice as examples of the insects whose eggs produce the cut-worms. Though so common, they are seldom seen in the day time, being then at rest, secreted in dark situations, such as the crevices in stone walls and the cracks under the clapboards of buildings. By looking behind the window-shutters of my office at any time in July or August, I am able to obtain specimens of the Devastating Dart and one or two other less common species.

These worms have several natural enemies. That universal pest of the cornfield, the crow, visits the fields, equally as much to obtain cut-worms as for corn, and would probably do but little injury to the latter if he could find worms enough to glut his appetite. Numbers of them are also destroyed by predaceous insects. One of the most common of these is pretty generally known to our farmers, who sometimes designate it the "cut-worm's dragon," from its singular form and ferocious habits. It is a large black and rather slender and flat larva of a beetle of the family CARABIDÆ, and I presume it is the *Pangus caliginosus*, but those individuals which I have attempted to rear have always perished before completing their growth. It is very agile in its motions, and roots and buries itself under the loose dirt with facility. When not glutted with food, it is running about incessantly, in search of these worms, and slays them without mercy, with its powerful jaws seizing them commonly by the throat, and regardless of their violent writhings and contortions, sucking out the contents of their skins. M. F. Morrison, of Bath, Steuben co., N. Y., gives some interesting particulars of another insect enemy of the cut worm, in the Albany Cultivator, vol. v, page 18. He says, "A few years since a remarkable insect, somewhat resembling the black wasp, but longer, shaped somewhat more like the hornet, but of a shining black, and very active, was pointed out to me as the natural enemy of the grub worm. Its evolutions when on the ground were similar to that

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of the hound upon the track of the hare. Its head was down, as if in the act of smelling, and every few minutes it would dig with its fore feet in the manner of the dog. At length it dug up a worm, stung it to death, and left it. On a succeeding day I saw the same insect engaged in burying the victims of its warfare. A hole was excavated in the soil sufficient to deposit the worm by the use of its fore feet. The dead worm was then seized by the forcep jaws of the insect, who drew it backwards into the hole into which it entered in rear of the worm, and from which it immediately emerged, and scraping the earth together raised a tumulus over the grave."

As to the best modes for subduing the cut-worm and guarding against its ravages, only a few words will be necessary, as this topic has been so often discussed in our agricultural journals. Commonly only one or two stalks in a hill of corn or beans are cut off, and the remainder are left unmolested, the worms appearing to require but a few meals of this kind, just as they are on the point of changing to pupæ. It is well, therefore, to plant so much seed as will enable these depredators to glut their appetites without taking all the stalks in the hill. Observation has long pointed to this as a precaution which should always be taken. Hence the old rule as to the number of kernels which should be planted in each hill of corn—

"One for the black-bird and one for the crow,
Two for the cut-worm and three to grow."

But occasionally these worms are so numerous that active exertions must be put forth to save the crop from destruction. And general experience shows we have as yet only one resort which is perfectly certain and reliable, to wit, digging the worms out from their retreats and destroying them. To go over a large cornfield carefully, on this errand, and promptly as the exigency of the case demands, is quite a formidable task. Still, every one will perceive on a moment's reflection that when this measure is necessary to save the crop, the same amount of labor can scarcely be bestowed elsewhere so profitably.

It however is very desirable that some effectual and more speedy mode of combating these insects should be discovered. So long ago as 1817, a notice in the newspapers stated that making

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a few holes about the hills with a sharp stick was an easy way to entrap these worms, as they would fall into such holes, and being unable to crawl out of them, would perish—some of the holes being found half full of worms thus gathered in a single night. A writer in the Michigan Farmer, whose communication was fully noticed in the Country Gentleman of June 7th, 1855, bears strong testimony to the efficacy of this measure. From my own observations it appears that these worms are never able to crawl the length of their bodies up a perpendicular bank of earth, before they loose their foothold and fall. I hence presume the measure above spoken of will be effectual. Indeed, if my supposition is correct, that these worms mostly come from the surrounding fields, to the places where we notice them, I have thought that a single deep furrow, struck around the outside of a field or garden, when the worms are first beginning to appear—any break in the land-side of the furrow being repaired with a hoe—would form a barrier over which it would be impossible for them to make their way—thus protecting the whole field effectually and at a very trifling cost. I hope in one or two summers to complete my observations so that I can speak with more confidence upon this subject than I am able to do at present.

Crowded together and covering the stem which bears the ear; small dull-green and reddish lice, slightly dusted over with a fine white powder.

The Maize Aphis, *Aphis Maidis*, new species.

In August, the person who is selecting soft corn for boiling, will sometimes come to an ear, the stem of which is entirely covered with vermin. On examining them they are perceived to be small plant-lice of a lurid green color, intermixed with slightly larger dull reddish ones, and an occasional individual is found among them having wings and a black body. They are thinly dusted over with a fine white powder, like meal, and scattered about among them are seen the empty skins which the larger ones have shed. Each individual is stationary, with its beak inserted into the stalk, sucking its nourishment therefrom. They continue upon those stems where they have once established

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themselves, until the corn is cut down or ripens and the sap ceases to circulate in the stalks, whereupon they perish. They occur upon no other part of the stalk except the peduncle or stem which bears the ears. And such a multitude of them as is found clustered together upon this stem, of course abstracts from it much of the sap which should go to nourish the ear and swell the kernels. Should these insects, therefore, ever become multiplied so as to infest a considerable portion of the ears in a field, it is evident they would do much injury to the crop. And like other kindered insects, it is probably they will at times become thus multiplied.

These insects belong to the family APHIDÆ in the order HOMOPTERA, and to the genus *Aphis*. They are plainly a different species from one which infests the maize in Europe, the *Aphis Zeæ*, of Bonafous, described in the Annals of the Ent. Soc. of France, vol. iv, p. 658, and I propose to designate them the MAIZE APHIS, *A Maidis*. The remedies for insects of this kind were treated of in my first report, under the apple plant-louse, and it only remains for me to give a description of this species in the different stages of its growth.

The LARVA, when newly born, is 0.03 in length, with the opposite sides of its body parallel, or very slightly wider posteriorly; of a yellow color, the hue of beeswax, the head pale watery yellowish, the eyes black, the antennæ, legs and beak white, the latter long, reaching beyond the base of the hind legs, the nectaries or honey tubes short, merely slight tubercular elevations, and white. These, I think, are individuals which are destined to acquire wings, whilst those which are to remain without them are pale green, much the same color with the surface on which they are placed, the thorax and the tip of the abdomen greenish white, the head slightly dusky, and the tips of the antennæ, legs and beak acquiring a blackish tint soon after birth.

These latter larvæ grow to an oval form and a dull green color, with the head and thorax blackish, the abdomen above with two rows of black spots along the middle, the anterior spots confluent transversely, forming a short band, and with three bands at the tip, and an additional row of black spots upon each side.

The WINGLESS FEMALES are dull blackish faintly tinged with green, the color obscured by a glaucous bloom or fine powder with which they are dusted over, the head and commonly two bands upon the thorax smooth and black, with spots of the same along the sides of the abdomen and sometimes upon its middle also, the tip of the abdomen drawn out to a black point with two smooth black bands forward of it, the nectaries black and their length about half equalling the distance from their base to the tip, the antennæ black and nearly half as long as the body, the legs black with the shanks whitish except at their tips. They are of a plump oval form, rather broadest back of the middle. Their beak is pale, its tip black; it arises from the lower part of the head and reaches only to the base of the middle legs, between which is a deep groove for its reception when at rest.

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The yellow larvæ first spoken of are about as numerous as the green ones, and acquire a pale obscure red color, dusted over with a fine whitish powder. They change to PUPÆ, which are known by having a scale on each side of the body, which is the sheath in which the future wing is enveloped at this period. These scales are pale yellowish, their tips dusky. The pupæ are 0.06 in length, dull red and dusted over with a glaucous powder, oval and less plump and convex above than when they were in the larva state; their heads are dusky, antennæ obscure yellow with dusky tips reaching to the base of the wing scales, legs dusky, the thighs except at their tips, and also the anterior shanks obscure pallid.

The WINGED FEMALES which come from these pupæ are scarcely 0.06 in length, and to the tips of their wings 0.10. They are black, the abdomen dull lurid green, with black punctures and dots along each side, and three black bands at the tip, and opposite these on the under side a transverse black spot. The nectaries, legs and antennæ are similar to those of the wingless female.

AFFECTING THE STORED GRAIN AND MEAL.

In stale Indian meal and emptying-cakes made thereof; a soft white worm half an inch long, with a brownish yellow head and polished yellowish white spot above on the neck, and on the last segment.

The INDIAN MEAL MOTH, *Tinea Zeæ*, new species (Plate 4, fig. 1).

Our housewives are sometimes vexed with finding their store of emptying cakes, which are used for exciting fermentation in dough, invaded and spoiled by worms. If the bag or box in which these cakes are kept happens at any time to be left open, the winged moths from which these worms proceed are liable to find their way into it, and scatter their eggs through the cakes, so that the whole of them are at a subsequent day discovered to be infested with worms. As Indian meal is the chief ingredient in these cakes, I infer that to be the favorite food of this insect, and that it might therefore exclaim, with the enraptured Barlow in his Hasty-pudding,

> "All my bones were made of Indian corn—
> Delicious grain!"

More particularly where the meal of maize has been long kept and has become stale, I suspect this insect will be apt to infest it. But it is only in the situation first spoken of that I have as yet met with it.

The worms appear to have the same habits with the larva of the grain moth or the wolf, *Tinea granella*. They form cylindrical burrows through the substance on which they feed, lining the

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sides of this passage with fine threads like cobweb. They crawl over a smooth surface with facility but not rapidly, and when annoyed they wriggle slightly and walk backwards. They grow to the length of half an inch, and are of a cylindrical form, slightly broadest in the middle. They are dull white, soft and flesh-like, the sutures between the segments but slightly marked and not constricted. Their heads are of a hard horn-like consistence, shining, brownish-yellow. The second segment or neck on its upper side is also horny, shining, yellowish-white; and on the top of the last segment is a spot similar to this. They are sixteen-footed, the prolegs being short, and their minute hooks form a brown ring around their soles. The surface shows a few scattering hairs, which on the sides arise from very faint smooth wart-like dots.

The pupa or chrysalis is 0.30 long, pale yellow or yellowish white, its sutures marked by fine slender chestnut brown lines, and the eyes prominent, rather large and black. It lies within a slight cocoon which is attached to the side of the bag within which the larva has been reared. The cocoon is formed of fine snow-white silken threads, appearing like a coating of mildew, through which the chrysalis is very visible.

The winged moth moves with frequent skips as it is walking along. It crawls out of its lurking place, till it sees its way clear from any obstruction, when it spreads its wings and flies away, hovering about the shady corners of the room and sustaining itself some time upon the wing without alighting. It is destitute of any marks or spots by which to distinguish it, being merely of a dull gray or blackish color with the basal third of the fore wings whitish. It pertains to the Family TINEIDÆ of the Order LEPIDOPTERA, and appears to coincide more closely with the genus *Tinea* than any other which has been characterised by systematic writers, although in the greater length of its spiral tongue and of its body it does not fully agree with the typical species of this genus.

The INDIAN-MEAL MOTH, *Tinea Zeæ*, (plate 4, fig. 1) is about 0.35 in length to the tip of its abdomen and closed wings, and when the latter are spread it is from half an inch to 0.60 in width. It has a slightly greasy appearance, and its fore wings are obscure gray or blackish, their basal third dull white or cream

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colored, appearing as though denuded of their scales. Commonly a dull tawny yellow spot beyond the centre of the wing is more or less distinct, and sometimes there is a band of the same color on the hind margin, which is broader towards the outer edge. Their tips are rounded and the hind margin is cut off obliquely and feebly rounded. The hind wings are white and slightly glossy, with a pale leaden blue reflection, their hind edge and tips pale brown. They have a long silky whitish fringe, which is longer on the inner margin, and shows a more pure white band on its base. The body is of the same blackish gray color with the fore wings, often varied with tawny yellow or reddish upon the neck and the hind part of the thorax. Beneath it is of the same color as above, the wings being pale leaden, the lustre of satin, the hind pair paler. The shanks of the hind pair of legs are thickened and robust. The antennæ are without any hairiness; they taper slightly, and are about two-thirds the length of the body. The feelers are longer than the head and are held horizontally forward, forming, in connection with a small tuft of hairs projecting forward from the face between their upper edges, a conical beak. Their apical joint is distinctly exposed, small, twice as long as broad, and is oval or slightly thicker towards its base. The spiral tongue is long, and when alive the abdomen extends to the tips of the closed wings.

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3. THE HOP.

AFFECTING THE LEAVES.

Eating numerous holes of various sizes in the leaf, often consuming nearly all the leaves except their veins; a small pale green worm with whitish stripes and black dots placed symmetrically.

The HOP-VINE SNOUT-MOTH, *Hypena Humuli*, HARRIS, *H. rostralis?* LINNÆUS, (plate 1, fig. 1.)

Although throughout our country generally, no attention is given to the cultivation of the hop, it is a staple product of a few of the central counties of our own State, and at times a most lucrative crop, yielding its growers munificent returns. Nearly three-fourths of all the hops produced in the United States are raised in the State of New-York, the single county of Otsego, according to the cenus of 1850, yielding over a million of pounds, and the adjoining counties of Madison, Oneida, and Herkimer each much surpassing any other districts of similar extent in any part of our country.

In England, where the hop has been extensively cultivated for a long time, it is well known that it is liable to be severely depredated upon at times, by insects; insomuch that the revenue which the government derives from this source is extremely fluctuating, frequently varying to the amount of half a million of dollars per annum. And Kirby and Spence, alluding to this subject, say: "The hop-grower is wholly at the mercy of insects. They are the barometer that indicates the rise and fall of his wealth." In our own country this crop appears to be similarly exposed to injury from this class of beings, that it is abroad. The larvæ of the insect which we have named above, is with us the most universal and formidable of these depredators, making their appearance suddenly, and in a few days sometimes, and before their presence is noticed, completely riddling and destroying the leaves of whole fields.

These worms begin to appear upon the leaves as early as the fore part of June, and by the middle of that month they will be found of all sizes. The vines are now rapidly climbing the poles, and the older leaves, near the ground, where the dense foliage enables the worms to secret themselves more securely, are those

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on which they first feed, perforating them with round holes between the veins. The leaves are also sprinkled over with black grains, the excrement of the worms. When not engaged in feeding they repose upon the under surface of the leaves or upon the leaf stalks, stretched out straight and more slender than at other times, showing three or four fine transverse impressed lines at each of the sutures. When crawling it arches its back upwards, like a span worm. Dr. Harris is in error in saying that it does not suspend itself by a thread. On carefully looking at an infested vine, some specimens will almost always be noticed hanging down from the leaves. Their attachment however is very slight, and on the slightest agitation of the leaf the worm lets go its hold and drops to the ground, wriggling briskly for a short time after touching the surface. They continue upon the leaves until the middle of August or later, new broods appearing as the old ones vanish. The hops growing upon vines thus stripped of their leaves are small and but few in number.

The LARVÆ when young are not thicker than a pin and are broadest at the head and gradually taper from thence to the tip; they are watery white, more or less clouded with grass green in the middle from inclosed alimentary matter. When larger they become of a cylindrical form, strongly constricted at the sutures, and are pale green above, commonly showing a deeper green stripe along the middle of the back; head and under side greenish white; a white or pale greenish stripe along each side of the back, and sometimes a slender whitish line along the middle of each side; four black dots above, on each segment, at the angles of an imaginary square; five dots upon each side, the upper one above and the next one in the lower edge of the slender lateral whitish stripe; each of these dots yielding a hair; head with several black dots symmetrically arranged, and on the three next segments the dots are placed in transverse rows; mouth yellowish, with the tips of the jaws black. The legs are but fourteen in number, the prolegs being placed on the 8th, 9th and 10th of the thirteen segments.

The worms attain their full size in about a fortnight after they hatch from the eggs, and are then an inch or more in length, when stretched out in repose. Some of them enter the loose dirt slightly, to change to pupæ, others crawl between or beneath lumps of dirt, and others merely secrete themselves under or partly under leaves lying on the surface of the ground. They do not enclose themselves in cocoons, but assume the pupa form by throwing off their larva skin. The pupa is half an inch long and is at first of a grass green color on its back and greenish-white beneath, with a tawny band on the middle of each seg-

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ment. It gradually changes to a mahogany brown and finally to a black color. The pupa state, in the middle of summer, lasts about twelve days.

The moths which come from these worms belong to the Family PYRALIDÆ of the Order LEPIDOPTERA, and to the genus *Hypena*, which is characterised by the length and form of its feelers, one of which, highly magnified, is represented, plate 1, fig. 1 *b*. They are quite long, and project horizontally forwards in front of the head, resembling, when pressed together as they usually are, a beak or proboscis, from which circumstance the species of this genus have derived their common name, snout-moths. These moths are extremely variable, being sometimes much darker colored, and the markings and scales upon their wings are peculiarly liable to be more or less obliterated from frequent contact with the rough scabrous leaves of the hop. This renders it difficult to determine whether the hop-vine snout-moths of this country are a distinct species from those of Europe, which are similarly variable. Dr. Harris has treated of our insect "upon the supposition that it is distinct," though he alludes to no marks which indicate it to be different; and the full descriptions of the European moth given by writers coincide quite accurately with our insect. Mr. Westwood notices the singular fact that some of these moths come from their chrysalids in winter, about the period of Christmas, and that all these individuals are the most dark colored and sooty, with their marks the most obscured of any belonging to their race. And on last Christmas eve captured a moth flying about my room which was found to be one of these black obscure individuals of this species. From whence it could have come at that inclement period of the year was a mystery. Thus all the circumstances indicate that this is a species which has been introduced upon this side of the Atlantic among hop plants brought here from Europe. But until I am able to verify this fact more fully, by comparing our insect with European specimens, I refrain from making any alteration in the record as it now stands.

The HOP-VINE SNOUT-MOTH or HOP-VINE HYPENA (plate 1, fig. 1), measures about an inch and a quarter across its wings when extended. It is very variable. The most perfect specimens are of a dull brown color with a black stripe on the middle of the thorax; fore wings with a large rhombic darker spot on the middle

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of their outer margin, with two elevated coal black dots near its inner anterior and two others near its inner posterior angle; this spot sometimes extends to the base of the wing, and is commonly margined behind by a pale gray oblique spot or streak, in which is sometimes an angular brown line, like the letter V when most distinct; often a row of black dots posteriorly, parallel with the hind margin, as shown in the figure; hind legs black; fringe blackish brown; surface with scattered elevated black points. Hind wings pale dusky brown, edged posteriorly with a darker brown line, the fringe paler.

When the worms commence their depredations on the leaves, in June, the winged moths which are then found among the leaves, and which there can scarcely be a doubt are the parents of the worms, are of an ash gray or dull white color, so much paler than those which hatch from the worms later in the season that they would not be regarded as belonging to the same species. They at this time appear much like the species described by British writers, supposed by Mr. Stephens to be the *Hypena obesalis* of Treitschke. This came to be regarded as a British insect, from a single specimen which was found in the celebrated collection of Mr. Francillon. But as no other specimen has ever been met with in England, Mr. Stephens finally rejected it from the British list, and supposes that the specimen which had misled him was probably a native of Bavaria, where Treitschke met with the species which he describes. But as it is now known that many North American insects were carelessly placed with the British specimens in Mr. Francillon's collection, it is quite probable that this Hypena was also from this country, and is merely one of these pale *vernal* varieties of the hop-vine snout-moth which occur upon this side of the Atlantic. Except in being so much lighter colored and having their marks more pale and indefinite, they correspond with the description above given, but show in addition an oblique dusky streak upon the tip of the wing, running towards the disk, this streak being caused by a slight plait or groove in the wing, in which groove the scales are less effaced.

Several of the species of Hypena are marked like the present, with little elevated tufts of scales jutting abruptly out from the surface of the fore wings. In other species no such tufts appear. We have a rather pretty example of this last kind of snout-moths, in an insect which may be met with with in our forests about the middle of June, and which I name.

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The ELEGANT HYPENA, *H. elegantalis* (plate 1, fig. 2). It is an inch in width across the expanded wings, and of a bluish gray color, sprinkled with innumerous tawny atoms. Across the middle of its fore wings is a broad wavy tawny yellow band, edged posteriorly with a black line. This band is widened in its middle, where it incloses a large cream white spot having a black dot on its inner part. Forward of this, towards the base, is a narrow wavy tawny yellow band. On the apical part of the wing is a large pale tawny cloud, around a gray patch upon the apex. On the hind margin is a narrow tawny band, edged on each side by a black line, the inner line regularly undulated. The fringe is white with black alternations. The hind wings have a black central dot in a broad whitish band which is edged on each side with tawny brown lines, and behind this is an irregular tawny yellow band. The hind margin is marked the same as that of the fore wings, and the outer or anterior margin is white.

Syringing or showering hop vines with strong soap-suds or with a solution of oil-soap in the proportion of two pounds of the soap to about fifteen gallons of water is the only remedy which I have seen mentioned for ridding them of the Hypena worms.

[*Supplemenrary note to page* 220. The dry leaf, forming a wheel or whirligig on the ends of the twigs of the button-wood or sycamore in the winter season, noticed as being perhaps drawn into this position by plant-lice or some other insect, I since find to be the natural leafy bract or stipule of the twig, which upon withering in autumn separates and surrounds the twig, forming the revolving wheel or collar alluded to. It is certainly quite a curiosity, which I do not observe noticed in any of our botanical works.]

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COUNTY ASSOCIATIONS.

Reports have been received from most of the County Societies. Many of them are interesting and useful. It is evident that they Societies are better sustained than at any former period. A number have reorganized under the law of 1855, and have secured grounds for their exhibitions, enclosed them and erected convenient buildings for the exhibition of articles. This will doubtless be adopted by other Societies, and will contribute to their prosperity and usefulness.

Several farm reports will be found, which give assurance of careful attention to the improvements of the present day, and show most conclusively, that farming in this State, judiciously conducted, returns a liberal reward to the farmer.

The Secretary visited several counties in different sections of the State, and was much gratified to witness the advance which has been made within a few years—and this is not confined to any one portion of the State, but is apparent in every section.

Lands are being drained—irrigation is practised—manures more carefully and judiciously applied—buildings neat and commodious are being erected—choice fruits are cultivated, and in not a few instances farms were found, which in every department can scarcely be excelled.

Farmers are not content to pass along doing as their fathers did—but feeling that improvements are necessary, and that they can be advantageously made, they enter upon the improvements of their farms with spirit, and success crowns their efforts.

It is a matter of regret that the returns of the last census could not be secured for the present volume of Transactions. Every practicable effort has been made to obtain from the proper office the returns of the agricultural portion of the census, but without effect—and we must wait another year before we are permitted to know how the agricultural interests of our State compare with previous years.

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ALBANY.

The annual fair was held in the city of Albany, Sept. 25-6-7. The number of entries were more numerous than at any previous fair. Cattle, 211 entries by 175 persons; sheep, swine, and poultry, 131 entries by 31 persons; horticultural and domestic department, 664 entries by 117 persons; in household and domestic manufactures, 391 entries by 238 persons.

Premiums awarded amount to $1,132, besides Diplomas and Transactions.

Receipts and expenditures:

Balance in treasury, 1st Jan., 1855,....	$1,070 07	
Cash, State Treasurer, ...	205 00	
Proceeds of fair, ...	3,769 02	
		$5,044 09
Disbursements:		
Premiums paid, ...	$1,050 00	
Enclosing grounds,.....	1,018 24	
Bills of previous year,,.....	245 06	
Salary of Secretary and Treasurer, ...	260 00	
Clerks, gate tenders, &c., ...	303 00	
Miscellaneous expenses,,.....	709 02	
		$3,585 32
Balance, ...		$1,458 77

The society re-organized at its winter meeting, under the act of 1855, and the following officers were chosen:

Officers for 1856.—President, Levi Shaw, Rensselaerville; Vice-President, Richard Kimmey, Bethlehem; Secretary, Chas. R. Wooley, Albany; Treasurer, Leonard G. Ten Eyck, Bethlehem; and six Directors.

ELIJAH CHESEBRO'S FARM, GUILDERLAND.

This farm is situate adjoining the Great Western turnpike, eleven miles from Albany, and contains one hundred and thirty acres. Ten acres in wood, the residue under cultivation. Fifty acres intervale on the Norman's Kill Creek, and planted to broom corn. The upland is rolling, the soil being a stiff loam. About twenty-one acres in meadow; twenty-two acres in pasture, on which were kept two span of horses, two yearling colts,

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one yoke of oxen, seven cows, and four young cattle turned to beef in the fall. The farm has been underdrained. Deep plowing is practiced, and liberal manuring is attended to, and the results for 1855 are as follows:

Fifty acres of broom corn,	$2,100 00
Forty tons of hay, at $15,	600 00
Young cattle for beef,	75 00
Profits of seven cows,	238 00
Use of Ayrshire bull,	10 00
Growth of colts,	50 00
From twenty-seven acres of plowed land the following products:	
One hundred and seventy-five bushels of corn,	131 25
Two hundred barrels of potatoes, at $1,	200 00
Two hundred bushels of buckwheat, 50c.,	100 00
Six hundred bushels oats, 43c.,	258 00
Ten bushels white beans, $2,	20 00
Corn stalks, ten loads, $3,	30 00
Fifty loads pumpions, $1,	50 00
One hundred bushels beets, at 25c.,	25 00
Twenty-five barrels apples, $1.50,	37 50
Productions of garden,	50 00
Thirty loads of straw, $1,	30 00
Two hundred loads manure, 25c.,	50 00
Two thousand lbs. of pork, 8c.,	160 00
Store hogs sold,	75 00
Sale of poultry and eggs,	100 00
	$4,389 75

ALLEGANY.

The annual fair for 1855, was held in Angelica, on the 20th of September. The attendance was quite large. The exhibition of cattle, horses and other stock, was fair, but small in comparison to her resources.

Agriculture is receiving quite an impulse from the high price of grain for the last two years, although there was but a small show of grain. Our dairy would compare well with any of her sister counties. In fruits and vegetables, there was quite a display.

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January 1, 1855—Balance in Treasurer's hands,.....		$205 14
Received of members,.....		122 00
Received of State Treasurer,.....		93 00
For admission fees and use of tent,.....		77 18
		$497 32
Paid premiums,.....	$210 00	
Paid for tent, ...	200 00	
Printing and incidental expenses, ...	26 61	
		$436 61
Balance,.....		$60 71

Officers for 1856.—President, Ransom Lloyd, of Angelica. Vice-Presidents, John G. Osborn, Rusford; Almond Benjamin, Centreville; Joseph Lockhart, Almond; L. S. May, Philipsville; Walter Loomis, New Hudson; W. H. Green, Alfred. Directors, John Holmes, R. C. Kendall, Daniel Edwards, Emulus Townsend, Joel Karr, John Simons, Hercules Darling, E. S. Bartlett, Ezra Starr. John J. Rockwell, Recording and Corresponding Secretary. James Lockhart, Treasurer, Angelica.

CATTARAUGUS.

The fair was neld on the 17th and 18th of October, in the village of Little Valley. About six acres of ground were *enclosed with a high board fence, (an innovation here—which, we are sorry to add, seriously disturbed the equanimity of an unsophisticated race, of the genus *bipes;* so innocent that *they* cannot comprehend why Agricultural Societies need money, and *they* consider it a down-right "speculation" to charge a shilling admission fee!) for the general purposes of the fair; an arrangement that added materially to the receipts over previous fairs, the convenience of exhibitors and committees, and the promotion of order.

The quality of the stock on exhibition was far superior to previous years. The entries were—10 stallions, 5 pairs matched carriage horses, 10 single carriage horses, 20 3, 2, and 1 year old colts; 9 bulls and bull calves; 12 yoke of oxen and steers; 27 cows and heifers; 33 sheep; and 3 lots of swine.

*By Horace Howe, Esq., without charge. The same amount of fencing and yards, for Chautauque county fair, cost $130.00.—*Secretary.*

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Although the stock exhibited was less in number than the previous year, yet the competition was of a higher grade, and was maintained with much spirit.

The exhibition of farming tools was quite large. Plows from Beecher & Dewey's of Ellicottville, and Lockling's of Perrysbury, were a credit to the county. There were fanning mills, wood mills, sash doors and blinds, stone ware, tin ware, and various other articles of manufacture worthy of consideration.

An interesting feature was the competition in flour, from wheat grown and manufactured in this county. The lots exhibited, gave *extra superfine* evidence that as good wheat can be raised and made into flour, in this county, as in other parts of the State. Wheat, exceeding 40 bushels to the acre, was raised here last year.

The butter and cheese exhibited were unworthy the county, in the number of lots; for as much, and as good quality of both, are made in the county, as perhaps in any other, according to population.

In the ladies' department, articles in numerous variety, embracing the useful and the beautiful, made that part of the *Fair* decidedly attractive.

The Society reorganised under the law of April 13, 1855. At a convention called for the purpose at Howe's Hotel, Little Valley, January 28, 1856, Dr. Lyman Twomley was chosen Chairman, and John Manley, Secretary.

Certificates of the organization were made, signed and acknowledged before F. Bucklin, Esq., J. P., and forwarded to the County Clerk and Secretary of State.

The officers elected for 1856, are Horace Howe, President; Lyman Twomley, Vice President; John Manley, Secretary; and Daniel Bucklee, Treasurer; all of Little Valley.

DIRECTORS.—Benjamin Fuller, Little Valley; Edward Harvey, Mansfield; C. W. Fuller, Wm. Penny, Little Valley; Nathaniel Walker, Mansfield; and H. R. Finch, Napoli.

The Cattaraugus Reservation brass band (17 Indians) attracted general admiration. Their superior musical attainments, and dignified demeanor, won the respect, sympathy and applause of the people who had the good fortune to listen to their music. The Indians wore a neat tasteful uniform.

H. C. White, Esq., of Buffalo, delivered the annual address, which gave good satisfaction, as it was practical and instructive.

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Hons. F. S. Martin, of Olean, and A. Leavenworth, of Cattaraugus, delivered brief, extempore addresses, contrasting the present prosperous condition of the county with its primitive condition of a few years ago. Both gentlemen were pioneers, and their remarks were very interesting.

At a monthly meeting held March 1, John Manley, from a committee appointed January 28, reported a code of by-laws, which was accepted—subsequently, (at the monthly meeting, April 5,) amended and adopted.

A committee of eleven, (residing in different towns,) was appointed to take into consideration the propriety of permanently locating the Society meetings and fairs, and report at the next meeting.

At the monthly meeting held April 5, the committee appointed at the last meeting, in relation to permanent location, reported that several of the County Societies have located permanently, and with very beneficial results, and a saving, after the first year, of the annual expense of building fences, pens, &c. They also reported that Horace Howe, Esq., offered to lease the Society ten acres of land in the village of Little Valley, for ten years, for an aggregate rent of ten dollars, and sell it to the Society, any time within that period, for fifty dollars per acre. The report was accepted, and it was unanimously

Resolved, That the "Board of Managers" be instructed to contract with Horace Howe, Esq., for the land, as reported by the committee, for the use of the society.

Receipts.—In treasury date of last report, ...			$24 64
From State, ...			86 00
Use of tent at Gowanda, ...			15 00
Memberships and shilling tickets,....			423 56
			$549 20
Expenditures.—Premiums, 1854, ...	$52 00		
do 1855, ...	260 50		
Printing and other expenses,	232 50		
Cash on hand.	4 20		
			$549 20

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CAYUGA.

Extract from report of Treasurer and acting Secretary, H. H. Bostwick:

The amount of receipts during the current year ending Dec. 20, 1855, was $1,113.40—which with the balance in treasury amounts to $1,575.09. The expenditures for premiums and expenses $989.94. Amount of premiums paid, $424.00.

A vote of thanks was tendered to the President, Abram Burlew, for the able and honorable manner in which he had discharged the duties of his office.

Officers for 1856.—President, T. S. Bentley, of Brutus; Treasurer, Henry H. Bostwick, of Auburn; Corresponding Secretary, Samuel Mack, of Brutus; Recording Secretary, P. R. Freeoff, of Auburn—and twenty-one Vice-Presidents.

A committee was appointed to make inquiries relative to the purchasing real estate for the use of the Society.

The next fair appointed for 17th and 18th September.

Products, Cayuga county, shipped east by railroad from Sept. 1855, to May 1856, from J. B. Dill:

Dressed hogs, 5,210, weighing 1,092.000 lbs., at $5.00 per cwt.; live fat hogs, 1,250; live store hogs, 1,813; fat cattle, 3,819; sheep, 10,000; horses, 200; butter, 25,100 lbs.; poultry, 90 tons; wool, 212,100 lbs., besides 200,000 lbs. purchased at woolen mills, Auburn; apples, 3,000 bushels; barley, 56,215 bushels, averaging $1.08 per bushel; oats, 9,222 bushels, averaging 38 cents. The whole amount paid farmers for above products, will amount to about $400,000. Barley and oats, are new products for shipment by railroad.

CHAUTAUQUE.

Extract from report of Hon. G. W. Patterson, President.

The annual fair of the society was held at Westfield, on the 12th and 13th days of September.

The canvas tent, 40 by 150 feet, belonging to the society, was put up for the reception and security of in-door articles.

The report of the treasurer for 1854 shows that the amount received for admission of members, at $1 each, was ...	$263 00
For sale of admission tickets, at 1s., ...	190 38
Amount received from the State, ...	143 00
Making an aggregate of	$596 38

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It also shows that the expenses for the year were as follows:

Expenses of the fair at Mayville,	$109 32
Paid for premiums,	404 00
Paid for printing,	77 31
Paid to new treasurer,	5 75
	$596 38

Officers for 1856.—President, Hon. Thomas B. Campbell; Secretary, Harmon J. Bliss, Esq.; Treasurer, Sextus H. Hungerford, Esq., all of Westfield.

The society designated Westfield as the place for holding the next fair.

The number of animals on exhibition was greater than at any former fair in the county, and there seems to be an increasing interest taken by the farmers and mechanics in the prosperity of the society.

The horses, cattle, sheep, and swine on exhibition were highly creditable to the farmers of the county; and they evince a determination not to be excelled, if the importation of the best stock that can be purchased in Europe, and subsequent good breeding, will keep them in the front rank.

The mechanical implements manufactured in the county, and on exhibition, were very numerous, and highly creditable to the skill of those engaged in that branch of industry.

Of the in-door articles, it is only necessary to say that they were numerous, and fresh from the fair hands of the ladies. They require no other eulogy.

Notwithstanding Chautauque produces excellent wheat, corn, and other grain, it is emphatically a grazing county. The product of the dairy has rapidly increased for many years past, and the butter and cheese of our county sells as high as any other in the New-York market.

The number of cows kept in the county, according to the late enumeration, is 33,244; and estimating the average income from them at $25 each, it will amount to $831,100.

Hon. Horace Greeley delivered an able and practical address before the society on the second day of the fair, which was listened to with marked attention. He dwelt at considerable length on the importance of using the subsoil plow, and of under-draining, both of which have been too long neglected by most of the farmers.

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The plowing match added much to the interest of the fair. There were nine competitors for the five premiums offered, and the task of the committee was a difficult one, in deciding to whom the several premiums ought to be awarded. The work was all admirably executed; so well, that every plowman went home with a prize in his pocket.

In order to avoid the charge of partiality, the committees on plowing, for several years past, have laid out the ground, and then retired till the work was completed, leaving a sub-committee to draw the lots for the plowmen, and see the plowing is done according to the rules of the society. On being informed that the work is completed, the judges inspect it, and award the premiums to the lots best plowed, without knowing the names of any of the competitors.

The greatest attraction was an equestrian performance on the part of the ladies.

The amount of money received at the fair is as follows:

Admission of members at 8s. each,	$464 00
Admission tickets at 1s. each,	664 63
Cash received from other sources,	45 32
Making in the aggregate,	$1,173 95
The expenses of the fair were in all,	1,041 31
Leaving a balance of	$132 64

besides appropriation from State to be drawn.

GEO. W. PATTERSON, *President.*

CHEMUNG.

No report has been received from this county, although an interesting fair was held. We give the farm statement of a young farmer of the county, Joshua S. Holbert, of Chemung, which shows a commendable and profitable management of the farm:

This farm, containing 140 acres, 120 acres of which are improved, "on which I keep 37 head of stock—3 horses, 1 yoke of oxen, 22 cows, 1 bull, 4 yearlings, and 5 calves.

"I harvested, the past year, the number of bushels of grain, as follows: 290 bushels of wheat; 100 bushels of barley; 1,400

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bushels ears of corn; 300 bushels of oats; and 75 bushels of potatoes.

"I gave the manner of making butter in my October report, and here I will give the number of pounds made over and above a large family use. The number of pounds made and sold in New-York city, to Messrs. J. L. Adams & Co., for the year 1855, is as below: my cows, to let to a tenant, would be called but 20, as one came in about the 1st of August, and 3 two year old heifers, which four would count but two full cows—but the whole number, inclusive, were 22; from which I have made four thousand one hundred and sixteen pounds of butter. My spring butter sold at various prices, from 27 cents, to 37 cents, without commission. The entire dairy sold, the last of November, for 31 cents. The whole amount received (including the three at Albany, at the same price,) of my dairy is $1,287.73.

"Aggregate income of the farm, rating the unsold and sold, is given below:

"For butter, ...	$1,287 73
pork, ...	211 02
290 bushels of wheat, at 12s,....	435 00
100 bushels of barley, at 8s, ...	100 00
1,400 bushels, ears of corn, at 3s,..	525 00
300 bushels of oats, at 3s,.....	112 50
75 bushels of potatoes, at 3s, ..	28 12
	$2,699 37"

(The average yield, per cow, it will be perceived, estimating the 22 cows and heifers, is 187 pounds each; and estimating 20 cows, which is all that could be estimated fully, is 205 pounds each—which is a very large yield for an entire dairy; and certainly is highly creditable to Mr. Holbert, who is quite a young man, just entering upon his career as a farmer. The yield of the 120 acres of improved land, from the statement above rendered, it will be perceived, amounts to $22.49 57-100 per acre.)

Officers for 1856.—President, John Jackson, Horseheads; Corresponding Secretary, C. M. Widrig, Horseheads; Recording Secretary, J. F. Dean, Horseheads.

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CHENANGO.

The Society held its annual fair at Norwich, the 26th and 27th of September. Our Society never had a better exhibition of stock; some of which drew the first premiums at the State fair. The address was delivered on the last day by P. T. Barnum, Esq., which was well received.

Receipts for 1855:

From State,	$122 00
Balance from last year,	317 92
Members,	468 00
From gates and citizens of Norwich,	576 66
	$1,484 58

Expenditures:

Premiums and expenses,	$1,031 73
Balance in Treasurer's hands,	452 85
	$1,484 58

Our fair has been permanently located at this place for the last four years, (this is the last year,) and I think with great success.

Our county, in an agricultural point of view, was never in a more prosperous condition. The farmers are reaping a rich harvest; every kind of production commands a high price. The crops have been good; hay, a great yield; all kinds of grain more than an average crop; potatoes good; butter and cheese more than average.

Prices.—Corn, 9s. per bushel; oats, 4s. per bushel; potatoes, 3s. per bushel; flour, $10 to $11 per bbl.; butter, 25 cts. per lb.; cheese, 10 cts. per lb.

With these prices and a productive season, our farmers have an easy road to wealth.

The principal production of our county is dairy and grazing There is no county in the State can excel ours in its good quality of butter.

We intend to keep up the agricultural interest, and hope to increase in numbers and reports, from year to year, until we can get all the farmers enlisted in this great work.

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The officers for 1856, are, Solomon Wait, Preston, President; Jonathan Wells, Norwich, Secretary and Treasurer—and seven Vice-Presidents.

J. WELLS, *Secretary.*

CLINTON.

The fairs of the Clinton Co. Agricultural Society, for five years previous to 1854, were held at the spacious and well arranged grounds and buildings which were erected by the Society near Keeseville. The location, however, proved to be injudicious, being at the southern extremity of the county. The Society consequently changed the location of the fair to Plattsburgh.

The Executive committee used their best efforts during the winter of 1854, to secure suitable and permanent grounds whereon to erect the necessary buildings and fixtures, but were unsuccessful, and it was decided that no fair would be held during the year 1854.

Permission having been granted by the Hon. Secretary of War, allowing this Society the use of a portion of the United States Barracks, and enclosed grounds at Plattsburgh, for the purpose of their exhibition, a premium list was adopted to the aggregate amount of $759—and the fair for 1855, was announced to be held on the 18th and 19th September.

A resolution was adopted declaring it to be one of the principal objects of the Society to diffuse agricultural, horticultural and mechanical information among its members and the community, and that a portion of its premiums should therefore be paid in Transactions of the New-York State Agricultural Society, and American Institute, and Agricultural, Horticultural and Mechanical publications, and that the following scale be adopted for that purpose—the selection being left to themselves:

Persons whose awards in the aggregate amount to

$2 and $3,	shall receive as above,	.....	$1 00
4 and 5,	" "	.....	2 00
6 and 7,	" "	.....	3 00
8 and over,	" "	.....	4 00

Thus, every person receiving awards to the amount of $2 and over, will be provided with reading matter of the best description and of his own selection. It is believed that by this plan agricultural publications will find their way into many families

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where they have hitherto been strangers. This arrangement has been received with great favor by the members of the Society generally. The following list shows the number already distributed in part payment of premiums:

Country Gentleman, 10 copies; Moore's Rural New-Yorker, 10 copies; New England Farmer, (weekly,) 1 copy; New England Farmer, (monthly,) 6 copies; Wool Grower and Stock Register, 6 copies; Horticulturist, 5 copies; Cultivator, 5 copies; Genesee Farmer, 5 copies; American Agriculturist, 6 copies; Transactions, 36 volumes.

A considerable number will be added to this as the unpaid premiums are called for.

The fair was held at the United States Barracks, on the 18th and 19th September. As the weather was unfavorable the first day, it was decided to extend the time for entries until 10 o'clock next day, and the business of two days was crowded into one. The judges commenced their examination about 11 o'clock, and their reports were handed in before 2 P. M.

The show of horses was allowed to be equal to any ever held in the county. The Sherman Black Hawk, owned by Lemuel North, Esq., took the first prize in the class of "Horses for all work," and is considered one of the best horses in America. He has subsequently taken the second prize in the class of "Roadsters," at the exhibition of the United States Agricultural Society, at Boston.

The show of cattle was small, few animals were brought from the distant towns. There were however some fine stock exhibited.

Of sheep and swine the show was very meager.

The show of fruit was decidedly good, and attracted much attention, although the number of exhibitors was small.

Some fine flowers and tasteful bouquets and designs were shown.

The show of manufactures, in many departments, was quite interesting and highly creditable. A fair show of agricultural implements was made, and gave evidence of progress in that department.

The Annual Address was delivered by the Hon. Lemuel Stetson, which was listened to with great attention and interest. He argued with the editor of a popular newspaper in the city of New-York, that partizan politics should have no place in discussions on these occasions, but said it was not easy to find speakers who could talk well on the subjects re-

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commenced, viz: *Deep Plowing*, *Manuring*, *Selecting Seed*, *Improving the breed of domestic animals*. He touched these subjects slightly and briefly, except the last, upon which he dwelt, arguing that *care* and *feed* produced results almost equal to *blood*, and rehearsed, with variations, the story of *Chronometer*, the first Durham bull in the State of Ohio, purchased by General Wright from the tail of Mr. Slick's peddling cart as a genuine *blood*, but which in fact was only an ordinary specimen of the native breed, just taken by Mr. Slick a little way back in payment for a clock. But the principal topic discussed was—What are to be the future markets for the produce of Clinton county? He showed that the limit of our country at latitude 45 had deprived us of the market suggested by nature, so that until the Northern canal was opened this frontier was without a market. After that we had a domestic and also a southern market, that had been productive of great local prosperity, but that was not all we ought to look for. That the true northern limits of the State of New-York, as claimed by the Dutch and English under the Iroquois was the south bank of the St. Lawrence, and that the markets for this county could not be complete without the peaceable annexation of the Canadas to the United States.

The grounds and buildings proved to be admirably well adapted for the use of the Fair, and thanks were voted with acclamation to the Hon. Jefferson Davis, Secretary of War, and General Jesup, Quartermaster-General, for the use of the barracks and grounds.

A meeting of the Executive committee was held on the 27th November, after due public notice, for the purpose of awarding premiums on "Field Crops." There were, however, no applications for premiums in this department. This will appear strange, in view of the abundant crops grown this season. It is believed that the stringent rules of the Society in regard to keeping exact accounts with the crops offered for premium was the principal reason.

It is believed that if farmers would generally make it a practice of keeping exact accounts with every crop, they would find it greatly to their advantage many ways, besides being always in a condition to contest for the prizes of this Society.

The Treasurer's account shows a balance received from Z. C. Platt, former Treasurer, of..... $23 88
From members, ... 170 00

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For admission tickets sold,.....	$268 60
For 36 vols. Transactions in payment for prizes, ...	36 00
For advance price on periodicals in payment of do, .	17 74
	$516 22

DISBURSEMENTS.

Paid incidental expenses, ...	$164 91
" premiums, ...	323 00
Balance on hand, ...	28 31
	$516 22

Officers, 1856.—President, John W. Bailey, Plattsburgh; Secretary, John L. Stetson, do; Treasurer, Edwin Benedict, do, and thirteen vice-presidents

COLUMBIA.

The annual fair of the Columbia County Agricultural Society was held at Chatham Four Corners, on the 19th and 20th of September, and was equal to any of the preceding fairs held in this county. We are much encouraged, as our Society increases steadily in its receipts and in the interest taken by the farmers.

The exhibition of horses was the best ever made in the county; the show of cattle was very large and fine; also a good collection of sheep and swine, and vegetables and fruit, was very fine indeed.

The annual address was delivered by John Stanton Gould, of Hudson.

Treasurer's report of Columbia County Agricultural Society, is as follows:

Cash on hand at annual meeting,.....	$90 47
From members, &c.,.....	341 32
From State, 1855,.....	133 00
	$564 79

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Sept. 20th.	By cash for premiums, as per vouchers,..	$410 50
	Miscellaneous, ...	82 86
	Balance in Treasury,.....	71 43
		$564 79

At the annual meeting of the Society in September last, the following officers were elected for the ensuing year:

President, E. W. Bushnell, of Hillsdale; Secretary, F. A. Gifford, of Hudson; Treasurer, H.W. McClellan, Chatham Four Corners; and five Vice-Presidents, and an executive committee of one from each town.

E. W. BUSHNELL,
President.

CORTLAND.

The annual fair was held September 25, 26, and 27, at their spacious grounds in the village of Homer, and in all its departments was most creditable to the county.

The high reputation awarded to this county for its dairy products, was fully sustained at the exhibition, and the display of fruits was peculiarly attractive. Stock, implements, domestic manufactures, vegetables and flowers, were all well worthy of the county.

The annual meeting of the Cortland County Agricultural Society, was held at Van Anden's, Homer, Dec. 27. Geo. J. J. Barber, President, in the chair. After partaking of a sumptuous agricultural dinner, the President called the Society to order, and delivered an interesting address; at the close, premiums were awarded on winter crops, dairies, &c., and the following officers elected:

President, Israel Boies, Homer; Vice Presidents, Stephen D. Freer, Cortlandville; Moses Kinney, Truxton; Hammil Thompson, Homer; Alfred L. Chamberlain, Cortlandville; Secretary, Charles R. Beach, Homer; Corresponding Secretary, Paris Barber, Homer; Treasurer, Morgan L. Webb, Homer; and an executive committee of twelve; H. B. Burr. Secretary.

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DELAWARE.

As may be seen by the report of my predecessor, the year of 1854 was one of disaster to this county. But our trouble did not end with the year; farmers had undertaken to winter more stock than there was feed in the county to sustain, and had it not have been for the large importations of corn, oats, &c., from adjoining and even more distant counties, many would have been unable to have kept their stock until the first of May. There is no doubt but a drouth affects a grazing more than a grain growing district, for while the grain grower loses his crop, we not only lose our crop, but are compelled to sacrifice largely upon our stock on hand. From the first of May prospects began to brighten, and success has attended the farmer in all his undertakings through the remainder of the year.

The chief marketable product of the county is butter, and most of the coarser grain, such as corn, oats, and a share of the buckwheat are brought to the aid of the dairy, being fed to the cows during the winter and spring. There was probably an increase of dairy products over last year of twenty per cent, and estimating the quantity by the most reliable statistics, and there would be at least four millions of pounds of butter made in the county in 1855.

Of the quality, the market price in New-York is the best criterion, being from 25 to 35 cents per pound, and in some instances a higher price. And although dairymen of Delaware county would prefer to stand upon their own reputation, yet a very large share of the butter from this county is sold in New-York as "choice *Orange county dairy.*"

The native cow is most common throughout the county, and believed by some to be the best for the dairy; yet others who have crossed the native with the Devon or the Durham think that while they have been adding to the beauty of their stock, they have lost none of the good qualities for the dairy, and can get much higher prices for animals they wish to dispose of.

The value of land has, for a few years past, been steadily increasing, and although the population of several towns in the county has decreased, the amount of property in such towns was never greater than at present.

Our annual Fair was held at Hobart, on the 19th and 20th of September, and was in every respect successful. At the commencement of the year there was not a dollar in the treasury, and

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a debt to pay. Over one thousand dollars in premiums were offered, the show grounds securely enclosed, and such restrictions made as prevented borrowing or lending badges, by which persons could smuggle themselves in without pay, and it is to the enforcement of those regulations that the Society, in a pecuniary point of view, is indebted for much of its present prosperity.

The citizens of Hobart are justly entitled to the thanks of the Society for their efficient aid. The exhibition in all the departments was most creditable to the county, and neat cattle specially attractive, and some very superior.

By permission I annex a table of statistics, prepared by Mr. Cyrenus Gibbs, of Harpersfield, with his reasons for so doing, which was read at our annual festival, in Hobart, on the 19th Sept., 1855. The following is an extract:

"Mr. President—The opinion has seemed to prevail, that Delaware county was far behind the other counties of the State in the amount of their productions; that the county was 'mostly grown to briars,' with now and then a cultivated spot; also, that we ought to change our mode of farming, by producing more grain and less butter, and thereby gain a position in the State more worthy of note. Now I hold such an idea to be wholly fallacious, as statistics taken from the census of 1850 will fully show, viz:

In population we are thirty-first, containing.....	39,684
Improved land, sixth, containing in acres, ...	52,942
Number of horses, twenty-ninth, containing.....	8,231
Milch cows, twenty-sixth, containing.....	34,493
Other cattle, sixth, containing	22,611
Value of stock, sixth, valued at.....	$1,948,626
Wheat, fiftieth, number of bushels,.....	20,295
Rye, tenth, number of bushels,.....	139,505
Oats, seventeenth, bushels, ...	591,571
Indian corn, forty-seventh, bushels, ...	118,335
Wool, twenty-sixth, lbs.,.....	165,221
Potatoes, fifteenth, bushels,.....	331,317
Buckwheat, fifth, bushels,.....	147,541
Butter, second, lbs,.....	3,780,285
Cheese, twenty-eighth, lbs.,.....	89,098
Hay, sixth, tons,.....	120,964
Clover and grass seed, first, bushels, ...	36,035
Maple sugar, ninth, lbs.,.....	469,517
Domestic manufactures, seventh, value,.....	$46,671

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"These are the principal farm productions of the State. Now, taking our population as a basis, which is thirty-one, and but three times do we go above, while we run sixteen times below.

"Again, take the value of farms for the basis, which is twenty-ninth, and it is still three times above and sixteen below.

"Two more items are worthy of notice, of those attending school we are 21st, and those who can neither read nor write 51st, numbering only 225. For 3,780,585 lbs. of butter, at 20 cents per pound, the average price for the last five years, we get $7,361.17. There are but two counties in the State, whose wheat crop goes above that amount, assuming $1.50 per bushel to be an average price, while each of those counties fall much short in the production of butter. With these statistics before you, I leave the subject for your consideration."

The annual meeting was held at Delhi, on the 2d of January, 1856. At which time premiums were awarded upon field crops, seeds, fruits, &c.

Expenditures, - - -	$738 61
Receipts from all sources, -	963 58
In Treasurer's hands, - -	$224 97

Officers for 1856.—President, Richard B. Gibbs, Harpersfield; Vice-Presidents, G. W. Hanford, Walton; Daniel Andrews, Stamford; J. E. Sherman, Sydney Plains; S. F. Miller, Franklin; R. D. Baird, Harpersfield; Henry B. Hawley, Hamden; Porter Frisbee, Meredith; Secretary, Sherwood D. Gould, Delhi; Treasurer, Hiram Olmstead, Walton.

R. B. GIBBS, *President.*

DUTCHESS.

The annual fair of this Society for the year 1855, was held at Washington Hollow, on the 25th and 26th of September.

The exhibition was all that could have been anticipated; every department was fully represented.

It could not be said that this exhibition exceeded, materially, that of former years, as every exhibition of the Society, since its organization, thirteen years ago, has been good; yet it was such as to show conclusively, that the interest is fully sustained, and that the farmers of the county are determined that the Society shall flourish.

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The Society has a large and commodious fair building, with ample grounds attached, properly fenced, and all other necessary accommodations, so that the exhibitions will, hereafter, all be at this place. This arrangement gives almost universal satisfaction, as the place is central, giving equal facilities to all. Everything connected with the society Seems to be conducted in harmony, and with a will that must bring every success that can be expected from an association of this kind. The Treasurer reports larger receipts than on any previous year.

The accounts stand thus:

Amount received from all sources,.....	$1,161 41
Amount paid for premiums and expenses,.....	1,005 87
Amount in the hands of the Treasurer,.....	$155 54

Officers for 1856.—President, Daniel B. Haight, Washington; Recording Secretary, George Sweet, Washington Hollow; Corresponding Secretary, John U. Abel, Union Vale; Treasurer, Richard T. Cornell, Clinton Corners.

ERIE.

Our fifteenth annual fair was held at the village of East Hamburg, on the 11th and 12th days of September, and was largely attended by the farmers and mechanics of the county.

This year, for the first time, we adopted the plan of enclosing the grounds, and taking a fee of a shilling of all that did not become members of the Society by the payment of one dollar, as one of the greatest difficulties we had always labored under was the want of sufficient funds. The officers of the Society have some years been obliged to go round at the close of the fair, and beg of some in order to raise the amount we were entitled to draw from the State; indeed, last year they failed to raise the amount by fifty dollars.

We were determined to endure this state of things no longer, although we were censured (as we expected to be,) by persons that have always been in the habit of attending our fairs, but never contributing anything towards sustaining them. But believing, as we did, that this plan would produce the necessary amount of the "needful," it was adopted, and, as I believe, will not be hereafter departed from in this county.

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We had enclosed nearly four acres of ground, in a beautiful grove, with a substantial board fence; inside of which were erected pens for sheep and swine, and arrangements for cattle and horses; and a hall over one hundred feet in length and about twenty feet in width, substantially covered with boards, under which tables were erected, on which was exhibited most of the domestic manufactures, fruits, flowers, the products of the dairy, needlework, paintings, &c., filled to overflowing.

On the north side of this hall was a long table erected, on which was placed the grain and root crops; a little south of this hall was erected the speaker's stand, around which seats were provided for the ladies and some others, enough, perhaps, for a thousand persons.

Around the speaker's stand and the hall was graded and prepared a circular track or course, about thirty rods in length, on which the horses were shown; it was also occupied for an hour the last day of the fair by a number of ladies showing their skill in riding on horseback, which, however profitable or commendable it may be, created a good deal of excitement and interest.

On the north-east corner of the ground was erected a temperance building, in which tables were set, and dinner cooked and served during the fair, at all times of day, when called for.

The show of stock of various kinds was creditable to the county, though, in some respects, perhaps, not equal to some previous years.

Of farm implements, Mr. H. C. White, of Buffalo, exhibited some very superior plows, cultivators, straw cutters, &c. There were a few very nice carriages and buggy wagons exhibited by Buffam & Brothers, and J. Bodima, of Lancaster.

The exhibition of grain and root crops was very good. B. Maltby presented a sample of winter wheat, the yield of which was stated to be thirty-nine bushels per acre; and Wm. Hambleton presented a sample of corn, the yield of which he stated to be over a hundred bushels per acre; and there were other very good samples both of grain and roots presented.

The annual address was delivered by the Hon. Horace Greeley, and contained much valuable instruction to the farmer, and was listened to by a large concourse of the farmers of Erie county. Although, perhaps, not all that heard Mr. Greeley will endeavor to follow him in all his propositions; still it had one good effect we intended it should have when we invited him to

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address us, and that is, it brought a large number of people to the fair.

Officers for 1856.—President, George W. Tift, Buffalo; Secretary, H. C. White, Buffalo; Treasurer, Geo. W. Scott, Buffalo. Our receipts from all sources this year (not including the State appropriation,) is..... $682 00
Premiums paid, and incidental expenses, about..... 550 00

Balance in treasury, ... $132 00

ALLEN POTTER, *President.*

[No. 217.]

ESSEX.

The election of officers for the Society was held in December, 1855. Hon. E. W. Rogers, President; J. W. Steele, Secretary; Wm. W. Root, Treasurer—together with nineteen Vice-Presidents.

The annual fair and cattle show, was held at Elizabethtown, September 1855, which, considering the unpleasantness of the weather, was well attended, and the usual interest was manifested in all the departments of the exhibition.

The amount received at the fair, was, ...		$369 67
From the State,.....		71 00
From L. D. Brown, late treasurer,.....		64 25
Total, ...		$504 92
Paid for premiums,.....	$294 20	
Printing, ...	40 50	
Clerk hire for Secretary,.....	7 00	
Gate tender and attendance on grounds,...	19 25	
Hay and grain, ...	12 02	
Miscellaneous, ...	31 23	
		$404 20
Leaving in Treasurer's hands the sum of		$100 72

J. W. STEELE, *Secretary.*

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FRANKLIN.

We have the pleasure of reporting the continued prosperity of our Society. A year of plenty has followed years of blight and disaster, and renewed hope in the breast of the farmer, prompts him to renewed efforts in the way of improvement.

The fourth annual fair of the Society, held in the village of Malone, on 19th, 20th and 21st September, was well attended and gave evidence that the occasion had not decreased in interest.

There was a better exhibition in all the departments than at any previous fair. The competition was spirited enough to make it an object to obtain a premium. Those who failed felt that another year would afford them a chance to try again. The number of entries of horses, cattle and sheep, were 220.

The exhibition of swine was good. From the exhibition of household manufactures and the dairy, we are warranted in saying, many a man in Franklin county, is not wanting a wife well willed, or a home pleasant and attractive.

The display in the mechanical department, was sufficient proof that we need not go out of our county to find skillful and enterprising artizans, ready and able to furnish us with what we need.

The third day of the fair, the Society listened to an address, replete with suggestions and instructive thought, from Col. Duane, of Schenectady.

The amount of premiums awarded was $570. Sixty-eight Diplomas, elegantly filled out by J. R. Seaver, of Malone, were also granted to exhibitors.

Enterprising farmers and mechanics, are beginning to find the annual fair an excellent medium for advertising the products of their farms and shops. Here they will be seen, and their superiority appreciated.

Those wishing to purchase choice animals or articles, and distrusting the empty puff and windy advertisement of a newspaper, find this the time and place where they can see, examine and compare for themselves.

With only thirteen per cent of our lands improved, we can never expect to rival many counties in the State in the amount of our products, but if there was a will, with a united effort, we might rate with the first in excellence.

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The receipts and expenditures for the past year have been as follows:

Amount receipts of fair,.....	$961 81	
Received from State Treasurer,.....	100 00	
	$1,061 81	
Paid premiums and expenses,.....	1,000 05	
Balance, 1855,.....		$61 76
Old fund in treasury,.....		340 94
Total Society's fund, ...		$402 70

The annual meeting of the Society was held on the 10th inst. A new constitution, conforming to the act passed by the Legislature, April 13, 1855, was adopted. The following officers were duly elected for the ensuing year:

Wm. Andrews, of Malone, President; Christopher Briggs, of Ft. Covington, Vice-President; D. R. Sperry, of Malone, Secretary; H. H. Horsford, of Malone, Treasurer; James Duane, B. H. Clarke, M. L. Parlin, H. W. Ketchum, James G. Dickey and John Doty, Directors.

D. R. SPERRY, *Secretary.*

FULTON AND HAMILTON.

The Agricultural Society held their annual exhibition at Broadalbin, Fulton county, on the 19th day of September, 1855.

The receipts of the Society during the year for entries, subscriptions, &c., were,..... $162 00

DISBURSEMENTS.

For premiums,.....	$84 75
Incidental expenses, ...	26 25
Balance on hand, ...	51 00
	$162 00

A statement was presented the Society by James & Amos Avery, in relation to wheat crop, having a yield of 96 bushels on 3 acres and 60 rods of land.

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Officers for 1856.—President, Isaac Lafever, Northville, Fulton county, Vice-President, Isaiah Young, Johnstown, do; Treasurer, Arch. Anderson, do, do; Secretary, Dan. Cameron, do, do. Executive committee of nine.

GENESEE.

At an adjourned annual meeting of the Genesee County Agricultural Society, held on the 5th day of February, 1856, the following persons were duly elected officers for the ensuing year:

President, Eden Foster, Elba. Vice-Presidents, H. W. Wright, Batavia; Charles Hannam, Pavillion; L. D. Kingman, Byron; Daniel Center, Darien. Secretary, H. J. Ensign, Batavia. Treasurer, C. Kirkham, Jr., Batavia, and Executive committee of thirteen.

HERKIMER.

The exhibition the present year was in all respects creditable to the farmers of the county, and in most respects was very fine. The annual gathering of the farmers to compare products, to show the excellence of industry, to unfold the secrets of success, to impart our own improvements and advantages to our neighbors, that they may be encouraged to go and do likewise, is highly beneficial to our progress and usefulness.

The display of horses was never equaled in the county; the cattle though not largely represented were of excellent quality. The fruit department was well represented. One of the most interesting features of the show was the equestrian exhibition; it was a great source of revenue.

Receipts for the year,	$1,167 08
Premiums and expenses,	836 52
Balance in treasury,	$330 56

At the annual meeting the Society directed the Executive committee to take measures to permanently locate the exhibition; and the Executive committee subsequently located for five years at Ilion, and a suitable lot of ground is to be provided with convenient erections for the display and protection of articles on exhibition.

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Officers, 1856.—President, S. McKee, Winfield; Vice-President, P. H. Warren, Columbia; Secretary, J. D. Ingersoll, Ilion; Treasurer, J. A. Rasbach, Ilion; nine vice presidents, and a town secretary from each town.

DUANE RICHARDSON'S PREMIUM FARM, EAST SCHUYLER.

My farm consists of one hundred acres; ninety of which is improved, and ten of woodland. The face of my farm is partly rolling and partly river flats. The soil is of different colors; some light, and some dark, and some cobble stone; subsoil rather clayish; the latter a loam intervale subsoil; considerable clay. The mode I adopt to improve the clay soil is to fall plow for sowing in the spring, and plow sufficiently late in the spring to have the soil clean and mellow before planting. I think there is no advantage in planting corn too early. I think we should not plant it until it is sufficiently warm to come up quick, and grow rapidly. I prefer plowing stubble land immediately after harvest, for any crop, fall or spring. I generally draw out the manure in autumn and spring, and plow it in soon, to save the strength and loss by evaporation. I generally plow from seven to eight inches deep; have made no experiments to test the difference between subsoil and surface plowing, but have found deep surface plowing invariably the best. My resources are not sufficiently extensive for the manufacture of artificial manure. I sow clover for the improvement of up lands, and deep plowing and draining for intervals. My crops are as follows: two acres of wheat, four of corn, three of potatoes, fourteen of oats, four of broom corn, five of buckwheat, and twenty of meadow. I leased three acres of land for corn and potatoes. My wheat was sown on high intervale soil, plowed in the fall and again in the spring. I drew on a light coat of straw manure, plowed it on the first of May, sowed about a week afterwards, a little over three bushels of China tea wheat, on two acres, harrowed it well, and then seeded it down with timothy, twelve quarts to the acre, and rolled it in; harvested twenty-four bushels to the acre, thrashed soon with a machine, and spread to dry. I have had some ground, it makes as good bread as any flour I can buy from the west. I cut the wheat just as it was leaving the doughy state. I sow my oats and plant my potatoes as early in the spring as the land can be put in order. I sow oats thickly, from three to four bushels to the acre. I generally cut potatoes to plant, but in a dry season I think to plant them without cutting is preferable, as they will stand the drought better. I plant potatoes three feet apart in hills, and

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corn three feet and a half. My potatoes have been somewhat affected by the common disease. I have tried on sod and old land, with and without manure; planted early and late, cut and whole; and concluded from experience, that good, dry, sweet soil, sod or old land, without manure, is preferable, as they are less liable to disease. I think the pale red is as safe a kind to raise as we can find. I use timothy on my flats, for seeding; timothy and clover, on my uplands, and clear clover for improving the soil. I sow timothy from twelve to sixteen quarts to the acre, according to the soil. I mow about twenty acres, and cut from one to three tons to the acre. I cut timothy when in full bloom; don't like to let the seed get ripe and shell; cure every day what we cut, if possible, so as to draw or cock up; don't like to risk hay out when I can possibly get it in. I salt my hay quite late. Too much salt is hurtful in the winter. I practice wintering my stock as follows: Soon as frosty weather commences hard enough to kill vegetation, I put up and fodder them nights. When winter sets in I feed them all they can eat clean. In stormy weather I only let them out in the middle of the day to drink and exercise. I think it will pay to feed ground grain to milch cows when kept up to hay. My management of fruit trees is to cultivate a young tree as you would a hill of corn, manure it, and keep the soil loose around it; wash the bodies with soap suds and lime water; prune them so as not to let them shoot too high. I practice mowing elders in July, Canada thistles in full moon in August; and as to white daisies, I think the best way is to hoe them and seed down with clover, or sow buckwheat and then seed down for meadow.

EXTRACT FROM THE REPORT OF J. D. INGERSOLL, ILION, ON "FRUIT ORCHARDS AND FRUIT GARDENS."

The "garden" in question, has for its soil a very strong sandy loam, thoroughly incorporated with cobble stones. It is a soil that will endure ill usage and hardship, equal, if not better, than any other with which I am acquainted. However I do not attempt to take advantage of its good qualities, and subject it to starvation and mortal treatment. The stones were first thoroughly cleared, great and small; those that were too small to be hand-picked, were carefully collected by the rake, and carried away. The soil is naturally porous and dry; hence, under draining has not been resorted to, as no stagnant water ever pervades, either on the surface or in subsoil. The whole has many times been thoroughly plowed, subsoil and surface;

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one, two, and frequently three boys were employed to follow the plow, and at once disengage any stone as large as a butternut, that unfortunately presented to view its flinty face. Having free access to an alluvial un-reclaimed marsh or swamp, containing many thousands of loads of the richest decayed vegetable matter, not ten rods distant, it may well be supposed that possible advantages are secured. I find this decidedly the finest article to enliven retentive clayish soils, and secure to them a proper porosity. Manure, or the compost, heap will not accomplish this one object so effectually as peat alone; although in itself it is not highly nutritive, yet it is the finest article that can be introduced into the compost, as a bedding for animals, as a deodorizer, and as a drainage for yards, &c., where liquids escape. It should never be applied to the soil immediately on being taken from its original bed; always expose it to the vicissitudes of the weather one entire season before using. A good application of *unleached* wood ashes is to be recommended.

There are about one thousand apple trees in this place, from one to fifty years old, comprising nearly all the leading and nicer varieties cultivated with us.

Of pears, there are about two thousand, Dwarf and Standards, varying from the bud to ten years. Pear trees flourish finely; it is not uncommon to see a growth of seven feet with rugged varieties: Last season, some Madelines grew six feet from the graft.

Beurre Deils flourish generally the best, they grow almost beyond calculation; bark very green and smooth, more so than any other kind.

We have the new variety "Philadelphia," which was sent us by Dr. W. D. Brinckle, of that place. It has not fruited, therefore we are yet to base our opinion on the encomiums given it by others.

No "blight" has been discovered yet, nor other disease, except the decay or blight of the bark on the trunk and large branches. Can find no remedy other than that afforded by the "pruning knife," which must be applied immediately on the first appearance of disease.

Plums flourish no better anywhere; we can grow trees at two years old larger and better, in every respect, than ninety nine one hundredths of all the trees sent out from nurseries pretending to be (as usual) "three and four years old." The

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Curculio is felt by us all. The tree is rarely affected by the "Black Knot." About twenty varieties are in cultivation.

Cherries flourish very well. Fifteen varieties are cultivated.

Strawberries, we have at our pleasure, in their season, comprising a few of the best leading varieties. We have given them the "best" cultivation, and the "poorest," and notwithstanding the number of volumes written on the subject of *extreme fertility* of the soil, deep spading, porosity, copious watering at the proper time, careful protection during winter, etc., we have been not a little chagrined to observe that the very best crop was produced on a little dry knoll, very hard and stony, which had not been manured in three or four years, and received no water during the season of severe drouth (1854) save the apologies for rain, which were few and far between. However no greater satisfaction can be derived by the lover of fine fruits than by cultivating the improved varieties of the Strawberry; their beautiful appearance and luscious sweetness can but be delightful to the eye and palate of all..

With raspberries and gooseberries we are well supplied, having all we wish, and a few for our friends.

Apricots, Nectarines and Peaches are rather shy. Of the former we have six kinds, and all except the Early Violet, were severely stricken by the frost of last winter; this kind endured the severity equal to an apple tree; not the least particle was frozen, while Dubois' Early Golden, standing not one rod distant, of the same age, was frozen to the root.

The Peach is but little cultivated. We have a few young trees that look well, and have endured the winters thus far, without loss in the least.

Grapes—here comes the leading idea. Nearly one hundred varieties are upon the premises, including most of the foreign kinds for vineries, which are best adapted to our climate and wants, and "all" the "hardy" kinds in the country that are generally known, together with a multitude of new varieties not yet generally adopted. Situated as we are in the valley, sheltered by hills on all sides, there is no place in this vicinity so well adapted to the perfection of the vine and its fruit as this; and the great demand for vines has led us to a general dissemination. We are collecting all new valuable kinds to be found in the United States, particularly Northern and Eastern, and thereby hope to supply demands for any kind in cultivation. On the premises is a vinery with apparatus for heating, in which

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we are now forcing between eleven and twelve hundred plants, expecting thereby to obtain larger and better developed roots for next autumn's sale than could be produced by a short season of growth. Thrifty vines are planted permanently in the border which is three feet deep, of the richest material the soil affords; such as manure from the yard, bones, peat, white sand, etc. It will not be necessary to enter into a minute detail of the construction of the vinery, and the treatment given it, as it would probably, interest but few; and I will only add that last spring forty vines of foreign kinds were planted in it, and by the first of August, all except one had grown at least eight feet, and several reached the top of the wall, fourteen feet, and were cropped. They were one year old when planted, and grew in pots, from the single eye, and about the size of a common pipe stem. With regard to the surety of a crop of hardy grapes in the open air, we apprehend no danger. Last season was the most contrary to the wants of the grape that has been experienced in many years, yet the crop ripened well.

JEFFERSON.

Annual Fair, September 19th and 20th, was a very excellent one, creditable to the farmers and mechanics of the county.

The annual address was delivered by B. P. Johnson, Secretary State Agricultural Society, to a very large and highly interested audience.

EXTRACT FROM REPORT OF VISITING COMMITTEE.

There is a very great contrast between the extreme drouth and consequent failure of crops for the last two or three years, and the abundant harvest of the present, so much so that the whole aspect of the country has been changed from a dry and parched surface to a beautiful green, and the long visage that was shaded with gloom and discouragement has put on cheerfulness and contentment; and although the high prices of the last year have passed, yet the abundance of the present harvest will make good the deficiency.

The committee regret that so few farms have been offered for inspection, and the only way they can account for the deficiency is, that all good farmers have had such an abundant harvest that they could not get *time* to apply, and the fact that no large

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farm has been offered in competition is sufficient proof of the above conclusion. And we also regret the necessity of withholding the first premium on farms, as there was none offered that in the opinion of the committee came up to No. 1, Letter A.

The introduction of the mowing and reaping machines into our country during the last year, of which at least 200 of our farmers have availed themselves, has marked an era in this progressive age that is visible in all parts of our country. The benefits attending their use have been, perhaps, more apparent this present season, in consequence of its having been, as the farmers say, "a catching time," for securing hay and grain.

The manufacture of butter and cheese is engaging the attention of a large number of farmers in all parts of our county, and from the opportunity that we have had of examining some of our best dairies, we should judge that the business had become systematized. From the fact that there is such a perfect uniformity of results, there must of necessity be a uniformity in the process of manufacture, which has been so ably discussed by our predecessors that we feel it would be labor lost to undertake to enlighten any one on the subject. The committee found it extremely difficult to determine the superiority of one dairy over another, and were it not made their duty by the regulations of the Society to make a distinction, they would cheerfully recommend a first class premium to at least one-half of the dairies examined.

The ten cheese dairies examined milked 327 cows, and had made up to the 1st of September 82,741 lbs. of cheese, averaging 253 lbs. to the cow. The butter dairies milked 126 cows, and had made up to the same time 13,855 lbs. of butter, averaging 111 lbs. to the cow.

The nurseries visited by your committee, are not only a credit to the proprietors, but may become a vast benefit to the county at large, as thousands of dollars have been sent out of the county in years gone by, for trees, that in a large majority of cases have been worthless. Not perhaps because the trees were not suited to the locality in which they were grown, and might have succeeded well there, but in removing them from the southern to a northern latitude, they have become sickly, and have died in consequence. We now have a very large number of the very best varieties grown in our immediate vicinity, that are not subject to the ills that usually befall foreign trees in changing their locality and climate, and we take great pleasure in recommend-

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ing to all who own or cultivate land, whether it be a large or small farm, to avail themselves of the opportunity now offered by the Watertown, Ellisburgh and Adams Center nurseries, where the choicest varieties of fruits and ornamental trees may be had in large numbers, of suitable size and age for transplanting, and as there was but one premium offered on nurseries, the committee assume the responsibility of awarding the premiums offered on cranberries to the second best nursery.

The gardens presented for the inspection of your committee did not require a very nice discrimination to determine which were the two best, but when the best of the two was to be selected we found ourselves in a fix. They each contain about three quarters of an acre under a very high state of cultivation, filled with a large quantity of a large variety of vegetables suited to a kitchen garden, interspersed with various kinds of cultivated fruit, with here and there a spot dedicated to Flora, and all perfectly neat and clean from weeds. We therefore recommend that two premiums on gardens be divided equally between them.

W. D. Carter's farm to which we award the second premium is situated in the town of Champion, and contains one hundred acres of improved and forty-eight of woodland. That part of the farm under improvement is in a high state of cultivation, being surrounded and subdivided into convenient and suitable fields for meadow, pasture, and tillage, by some 1,200 rods of half wall, 150 rods of board fence, and the balance rail fence, well laid, staked, and capped. The meadows are laid down smooth, and free from stone; thirty acres are in tillage the present year, and from the appearance, large crops are the result. Crops usually cultivated are spring wheat, oats, corn, and potatoes; very few weeds were allowed to grow on the farm. The white daisy that was quite plenty on adjoining farms has no abiding place on this. The buildings consist of a modern-built story and a half dwelling house, neatly finished from cellar to garret; one grain, one hay, and one dairy barn, well arranged, in good order, and well filled; a corn house, a piggery, and all other necessary out-buildings to make a neat and independent farmer's home. The farming tools were all housed in their proper places and in good order; has a good kitchen garden well filled with various vegetables and fruit suited to the climate; water brought to the house and yard from a spring twenty-eight rods distant, through lead pipe. There is an orchard of some two hundred

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apple trees, well trimmed and in full bearing. Also, a sugar orchard, from which is manufactured 1,500 lbs. sugar annually; has a butter dairy of twelve cows, with all the necessary fixings. The owner does all the labor on the farm, with the help of one man, without the aid of machinery, proving the old adage to be true—

"That he that by the plow would thrive,
Himself must either hold or drive."

The third premium is awarded to Clift Eames' farm, located in the town of Rutland, and contains one hundred and 25 acres of improved and thirty of woodland. Buildings consist of a first-class dwelling house, with necessary out-buildings; four barns, a work-shop and tool-house, a piggery; and a model milking shed, eighteen by sixty feet, enclosed and fitted with conveniences for twenty cows, and well ventilated front and rear—keeps a dairy of twenty-five cows. The present proprietor has occupied the farm twenty-five years, and from a rough stony one, he has made it smooth and productive. The farm is divided into convenient lots by some two hundred rods of stone wall, and rail fence staked and capped; has one hundred rods of under and one hundred rods upper drains. Barn yard made smooth and graveled, and supplied with water from a spring, brought through pump logs some thirty-five rods. Does farm work with horses, and uses Ketchum's mower. Has a sugar orchard of 900 trees, and makes from 2,000 to 3,000 lbs. sugar per year; also, an apple orchard in good condition. He kept a farm account book for twenty years, in which is entered all the operations of the farm, amount of sales, &c., a practice that cannot be too highly recommended, especially to young farmers.

Officers for 1856.—President, Hon. Benj. Maxson, Hounsfield; Secretary, A. P. Sigourney, Watertown; Treasurer, Hon. Willard Ives, Watertown; Vice-Presidents, James Brodie, Clift Eames, Hiram Converse; and six Directors.

LEWIS.

The annual fair was held at Turin, September 26 and 27.

The Executive committee beg leave to report that they have been highly gratified in examining the extensive display of articles in the floral, mechanical, and agricultural departments, and in finding

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them worthy of merit and praise; they are also gratified in witnessing the increased and increasing interest manifested by the people of Lewis county in our agricultural fairs. No former fair of our Society has equalled this of the present year in the number and quality of the articles presented for competition, whether from the work-shop of the mechanic or artizan, from the kitchen or the garden, the parlor or the drawing room, the stall or the stable, the dairy or the farm, each and all have alike contributed to render the fair of 1855 the superior in products of all its predecessors in *this* county. And the people of the towns contiguous to the place where the fair was held, need not shrink from a comparison in any at the fair departments, with any other equal number of towns in northern New-York. And such of our citizens as have taken a deep interest, and have expended much labor in bringing our exhibition to this present position, were abundantly repaid for all their toil in witnessing the triumphs yesterday of the "*Farmers' and Mechanics' Festival*," and had just cause for pride that they were the inhabitants of "Little Lewis," where the cultivation of both intellect and soil are so sure of rich remuneration. And the committee cannot but express a desire that our Society may live to a *good old age*, increasing in usefulness and interest, until all our inhabitants shall, with one accord, respond to the sentiment, "That an annual festival of the ladies and gentlemen, the mechanics and farmers of our county, for a comparison of progress, improvements, and social intercourse, is not detrimental to either happiness or prosperity.

The annual address was delivered by Charles D. Adams, Esq., of Lowville, which was of a practical character and listened to with interest.

Officers, 1856.—President, Lewis Stephens, Lowville; Corresponding Secretary, L. C. Davenport, Lowville; Recording Secretary, Charles G. Riggs, Turin; Treasurer, Moses M. Smith, Lowville; Six vice presidents and five Executive committee.

Fair located alternately at Lowville and Turin for six years.

C. G. RIGGS, *Sec'y*.

LIVINGSTON.

The Society in this county was reorganized under the act of 1855, and officers elected, and by-laws enacted for the government of the Society

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The Society leased fourteen acres of land within the village of Geneseo for 21 years, at the rate of $30 per annum. These grounds were enclosed at an expense of $628 37; an agricultural hall erected, 40 by 80 feet, 16 feet posts, at an expense of $1,293.53; a trotting course for the trial and exhibition of horses, one third of a mile in length, at a cost of $316.17.

The annual fair was held September 27 and 28, which was in every respect creditable to the Society, and the farmers and mechanics of the county. The annual address was delivered by D. D. T. Moore, Esq., Editor of the Rural New-Yorker, Rochester, and it was most creditable to the speaker, and interesting and instructive to those present.

The receipts of the Society were:

230 life members, $10,		$2,300 00
543 annual members, $1,		543 00
Licenses for stands, &c.,		22 00
Donations by citizens of Caledonia,		9 00
Sundries,		1 00
Admission tickets,		529 00
State Treasurer,		122 00
		3,526 00

Disbursements:

Fitting grounds,	$2,533 83	
Premiums paid,	241 77	
Miscellaneous expenses,	357 76	
		$3,133 36
		$392 64

Officers, 1856.—Charles Jones, President, Leicester; Richard Peck, Vice-President, Lima; George S. Davis, Secretary, Geneseo; Rodney Whitney, Treasurer, Geneseo; Charles Cott, Geneseo, George W. Root, York, Directors.

MADISON.

The annual exhibition was held at Morrisville, on the 11th, 12th and 13th September, and the occasion was one of interest and profit to the farmers of the county. The well earned reputation which the county has earned in the stock department was fully sustained.

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In the exhibition of horses, there was much to commend. The stock of the celebrated horses "Consternation," "Messenger," "Kentucky Hunter" and "Black Hawk," was well represented, and better stock than can be found with these strains of blood in them, for all the purposes of the farm and the road, we do not believe is to be seen in our State.

Durham and Devon stock of the choicest quality was shown, and the increased number of exhibitors is cheering evidence that the progress among the farmers is onward. The fine grade stock shows the marked advantage resulting from the introduction of superior breeding animals.

Wool and mutton sheep were well represented. Saxons, Merinoes and French Merinoes, South Downs and Long Wooled, of excellent quality, were shown. The increased demand for mutton sheep, is drawing attention to the South Downs and Leicesters, and farmers are finding that they can be reared at fair profits, and a ready demand for them when prepared for market.

In the implement department, and in the dairy, the show was creditable to the county. The ladies gave evidence of their handy-work, and though in quantity, not as extensive as desired, in quality it was all that the most fastidious could require.

The address was delivered by Rev. Beriah Green, of Whitesboro'. It was plain, practical and adapted to the occasion, as is the practice of the Rev. Speaker on most occasions. The receipts of the fair were $543.98.

Officers elected for 1856.—President, Alpheus Morse, Eaton. Vice-Presidents, Horace Hawks, Georgetown; John R. Chapman, Sullivan; M. D. Bailey, Lenox. Treasurer, S. T. Holmes, Eaton. Recording Secretary, Charles D. Miller, Smithfield. Corresponding Secretary, Lucius P. Clark, Eaton—and thirteen Executive committee.

C. D. MILLER, *President.*

MONROE.

The annual fair of the Monroe County Agricultural Society was held at Spencerport, on Thursday and Friday, September 20th and 21st, 1855. It was one of the finest and most successful held in the county for many years. The show of stock was unusually large, and generally good. The display of horses and working oxen was considered superior to that at any previ-

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ous exhibition, during the last decade. The show of sheep and swine, though not large was good in quality. There was not a large display of implements and machinery; the manufacturers of Brockport, however, made a very creditable exhibition in their department. The exhibition of domestic manufactures was also creditable. In fruits, flowers, &c., the display was not as large or fine as anticipated. The attendance on both days was unexpectedly large, and everything passed off satisfactorily—reflecting credit upon the officers of the Society and the local Committee of Arrangements. The address by L. Wetherell, Esq., of Amherst, Mass., was a creditable production and well received by the numerous audience.

The Monroe County Agricultural Society convened at the Court House, Rochester, Feb. 20th, pursuant to adjournment at annual meeting. Mr. President Hodges in the chair. Notwithstanding the almost impassable state of the roads, there was a good attendance, probably larger than at any meeting for several years. The proceedings were characterized by much enthusiasm and unanimity of sentiment, and an unmistakeable determination to place the Society upon a permanent and prosperous basis, rendering it creditable to its members and the county, and equal to the best agricultural associations in the State, and more than ever before, an influential and prominent auxilary in promoting rural improvement.

The minutes of the last meeting having been read and approved.

Mr. H. H. Sperry, of Henrietta, chairman of committee appointed at a recent meeting held for the purpose of adopting suitable measures to form a Farmers' Club, reported to the Society a plan of organization. The plan for organizing a club—making it an auxiliary or branch of the County Society, with same officers, and each member paying an annual fee of fifty cents—was discussed by Messrs. Barry, Sperry, Fogg, Hayward and others, and the matter subsequently referred to the committee on permanent location, to report at next meeting.

The question of re-organization of the Society having been discussed at some length, it was,

On motion of D. D. T. Moore,

Resolved, That we re-organize this Society, under the act of the Legislature, passed April 13, 1855, and that a committee of three be appointed to adopt suitable measures to perfect such re-organization, to report at next meeting.

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The President, Secretary and Treasurer, were appointed as such committee.

Mr. President Hodges, from the committee appointed at last meeting to ascertain at what price a tract of land suitable for a permanent location could be obtained, made a verbal report, mentioning several tracts favorably located near the city, each comprising from ten to twenty or more acres, at prices, varying from $250 to $500 per acre.

After a very general expression of opinion as to the advantages and disadvantages of the several localities mentioned as obtainable, the whole matter was referred back to committee on permanent location.

On motion of H. H. Sperry,

Resolved, That Messrs. P. Barry, C. F. Crosman and I. S. Hobbie, be added to the committee on permanent location, and that said committee make a definite report at our next meeting.

The subject of life memberships, and the best manner of securing a large number, next occupied the attention of the meeting. After an animated discussion, in which most of the members present participated, it was,

On motion of Mr. Sperry,

Resolved, That a committee, consisting of two or more from each town in the county, and five in the city of Rochester, be appointed to canvass for life members.

Messrs. Barry, Banning, Hodges, Hayward, Hobbie, and several others, discussed at some length, the probable rights and privileges of life members—the number of such members that would be necessary to procure grounds for permanent location, &c. The questions involved in the debate were finally referred to the committee on re-organization of the Society.

By a vote of the Society, the Secretary proceeded to receive subscriptions for life-memberships, and in a few minutes reported that *eighty-eight* life memberships at $10 each, had been subscribed for by gentlemen in attendance. This excellent commencement was hailed with pleasure, and, together with the progressive spirit previously manifested, clearly indicated the enterprise and determination with which members present entered upon the work of re-organization and reform.

The Society adjourned to meet at the same place on the 19th of March.

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A numerously attended and spirited meeting of this Society was held on the 19th March, at which its re-organization under the act of April 13, 1855, was completed. After the adoption of a constitution, &c., the following board of officers was elected:

Officers for 1856.—President, Willard Hodges of Brighton; Vice-Presidents, 1st, William Brown, Ogden; 2d, B. M. Baker, Rochester; 3d, H. H. Sperry, Henrietta; Secretary, D. D. T. Moore, Rochester; Treasurer, E. S. Hayward, Brighton; Directors, for three years, P. Barry of Rochester, and S. Leggett of Henrietta; for two years, C. B. Hebbard of Riga, and I. S. Hobbie of Rochester; for one year, A. B. Buckland of Brighton, and F. W. Lay, of Greece. On motion, F. P. Root, Esq., of Sweden, was appointed an honorary and advisory member of the Board.

The Society have obtained commodious grounds which will be prepared for their exhibitions the present year.

MONTGOMERY.

The fifteenth annual exhibition of the Society was held at St. Johnsville, on the 26th and 27th September. The arrangements were most creditable to the enterprising inhabitants of the village. The attendance was large, and deep interest manifested in the success of the Society.

The exhibition was not such in the various departments as this county might have made, though in many respects very creditable. The dairy exhibition was creditable as to quality, but limited—much less so than should have been in a county which produces butter and cheese equal to any in the State.

The next annual fair is to be held at Canajoharie.

Officers for 1856.—President, Wm. Knox, Canajoharie; Vice-Presidents, Wm. C. Phillips, Florida; Edward Walter, Palatine; Secretary, C. S. Brumley, Canajoharie; Treasurer, James Lansing, Mohawk.

NIAGARA.

The annual fair and cattle show of the Niagara County Agricultural Society was held at Lockport, October 18th and 19th, 1855. The exhibition was well attended, and the show of

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horses and cattle larger in number and of better grades than any preceding. Within the last three years there has been an increased interest in the purchase and production of improved breeds of cattle and horses; and we think the day not far distant when Niagara county will take rank with the most celebrated localities in the State.

The second day of the fair was devoted to the domestic, horticultural, and ornamental departments, which were largely represented, and exhibited in Ringueberg Hall. The show of fruit exceeded anything before exhibited in this county, and would bear comparison with anything in the State. The production of fruit is receiving the earnest attention of our citizens, and that too upon a soil and in a climate that will not disappoint their expectations.

An interesting address was delivered by Governor Hunt, and listened to by a large and attentive audience; after which, the reports of committees were made and premiums awarded.

Funds of the Society:

Receipts from members,	$365 00
Received from State,	93 00
	$458 00

Disbursements and premiums:

Paid to date,	335 95
	$122 05

The season, owing to frequent and heavy rains, has been very unfavorable for the principal agricultural crops. Wheat was nearly destroyed by the rains and midge, and the crop will scarcely average seven bushels per acre. Corn was also greatly injured by the protracted wet weather, and will not average over twenty bushels per acre. The crop of oats was large, and will exceed fifty bushels per acre. The barley crop will average thirty-five bushels. But little rye is raised. The average crop of buckwheat is twenty bushels Potatoes were greatly injured by the wet weather, and will not exceed thirty bushels per acre. The crop of peas was nearly destroyed by rain. Hay will average one and a half tons per acre. The yield of apples was unprecedented, some orchards averaging eight barrels to the tree The extreme cold weather last winter destroyed the peach crop.

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Considerable attention is being given to under-draining, and the results are entirely satisfactory. The benefit in a drouth could not be ascertained this season.

Agricultural pursuits are well repaid in this county, and the condition of farmers and farming land vastly improved.

DANIEL MORSE, *Secretary.*

ONEIDA.

The annual fair held at Rome, was attended with more than usual success. The attendance was large and receipts nearly $2,000. Many departments were fully represented, while some were not equal to former years. The Society is in a healthy and prosperous condition. The address at the fair, by Rev. W. E. Knox, of Rome, on "Education," was a very able and instructive one—showing the importance of education as it stands related to the wants of the agricultural and other industrial classes.

The annual meeting was held in Utica, January 10, 1856, and a very interesting address on "Farm life and its discipline," by Prof. Edward North, of Hamilton College. Premiums were awarded on winter fruits and root crops—and for an experiment in raising Indian corn, by H. H. Eastman, of Marshall. The statement of Mr. Eastman shows the result of twenty-five different experiments in the use of manures, in contrast with the strength of the soil without any manures; and these experiments are made upon the same soil, or upon different rows in the same field, so as to make it obvious that the increased yield of one row over another is made by the stimulating efforts of the special manures applied to the different rows.—(Vide ante p. 6—Mr. Eastman's statement.)

Officers for 1856.—President, Lorenzo Rouse, Marshall. Vice Presidents, Calvin Bishop, Verona; E. B. Lucas, Kirkland. Treasurer, H. R. Hart, Whitestown. Secretary, J. Wyman Jones, Utica—and ten Directors.

Henry R. Hart presented his report as Treasurer, showing the receipts for the year to be $1,908.99, including $255 from the State; and the expenditures were $1,464.95, including $785.75 for premiums—leaving $444.04 in the treasury.

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ONONDAGA.

The annual exhibition was equal to the expectations of the Society, and the grounds were filled during the days of the exhibition. The annual address was delivered by James W. Nye, Esq., and was listened to with marked attention, and a copy was solicited for publication.

The Society have secured commodious grounds near the city of Syracuse for the purposes of the Society, at an expense of ten thousand dollars, and the same will be arranged for the uses of the Society.

Among the proceedings at the fair was the Ladies' riding exhibition, which proved a very popular novelty—and liberal arrangements are to be made for its repetition next fall.

We give the excellent report on Farms, embodying much valuable practical information:

FARMS.

The committee on whom was conferred the duty and pleasure of examining farms with a view to award your premiums for the best cultivated in the county of Onondaga—Report as follows:

In the month of July last, we visited and examined twelve farms. Three only, we regret to say, were we previously invited to visit. The others, we respectively solicited their entrance for competition.

We conceive it to be unfortunate for this community that the subject of farming is so imperfectly understood, and that the best mode of farming has not been known and settled upon long since; but it is not our vocation to find fault or look after the imperfections of our friends, but to encourage, and if we can say something here to stir up the young farmer to increased activity, to arouse his energies, that he may resolve to put his farm in first rate order, his fences up, his buildings in repair, have his plowing done twenty per cent better than last year, the wet lands drained, particular regard paid to the best breeds of animals, and those kept of good quality and condition, the noxious weeds exterminated, and let there be a steady and constant improvement going forward, and we shall be satisfied that some little good has been accomplished. And further, permit us to add that you need not be afraid of agricultural knowledge; read

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the experiments of others, and think, and so far as they appear consistent, try them.

And permit us here to urge the propriety of keeping exact accounts of your farming operations; charge all expenses, and credit receipts, and balance your books by profit and loss. You will then have a system to base your future calculations upon and be better prepared to form a correct opinion as to your real interests.

We heartily congratulate the Society upon the increased attention of agriculturists of Onondaga county to higher and better cultivation, tending legitimately to larger and better crops; convincing testimony of this fact seems to exist in the presentation of twelve farms this year, in competition for the reward of your Society.

Your committee, deeply impressed with the importance of the trust committed to their charge, have devoted all the time and care that was requisite to render equal and impartial justice to the several competitors. Your committee are fully aware of the fallibibility of their own judgment, and of the difficulty of discriminating between the merits of some of the farms, their relative improvements being so nearly balanced. And here permit us to say that in the performance of these duties we went forward without fear or prejudice, having no friends to reward or adversaries to punish; and though competitors may be dissatisfied, and our fellow citizens disagree with us in judgment, yet we trust and fondly believe that the honesty of our intentions and the purity of our motives will not be questioned.

Your committee commenced to perform their duties by visiting Mr. Beard, in the town of Pompey. Mr. Beard received us with great cordiality, and seemed to take much pleasure in exhibiting his farm, stock, and whatever might interest us. His farm contains 220 acres, about twenty-five acres of choice timber, for farm purposes, fuel, &c. Road running nearly through the center of his farm. Fenced mostly with quarry stone—he has about 500 rods of full wall running north and south, east and west, enclosing fields varying in size from four to twelve acres at right angles. No winter wheat, fifteen acres of spring wheat, thirty-five acres of barley, six acres of corn, twelve acres of oats, eight acres of peas, two acres of potatoes, one acre beans and carrots, sixty acres meadow, forty acres of pasture. All the crops promising a good, and some of them a

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bountiful harvest. Average depth of plowing about eight inches; usually plows twice for a crop, excepting sods. Would prefer once plowing in all cases were it not for destroying thistles. Buildings—four barns calculated for grain, carriage barn and stable with basement for protection of manure, several sheds and hay lofts; keeeps 400 sheep; average weight of fleece four pounds; Spanish Merino bucks, ewes, grade Merino and Saxony; four cows, grade Durham and native; two yearlings, four calves; usually keeps but two farm teams and extra horse. Buildings and fences very poor when purchased. House nearly new, well and tastefully arranged, capacious enough for all domestic and farm purposes. The lady seemed to understand her part of the business well. General appearance of farm good; management generally approved; would recommend, however, the use of farm gates in place of bars; also the keeping of farm accounts.

Second farm viewed by your committee, is owned and occupied by Mr. David Beard, in Pompey, containing 100 acres. Twenty acres choice timber, no winter wheat, ten acres spring wheat, eight acres barley, six acres of oats, three acres of peas, two acres of corn, one acre of potatoes, twenty-five acres of meadow, the remainder pasture, &c.; wintered 123 sheep of very nice grade; buildings of the first class for farming purposes, nicely and tastefully arranged; fences almost entirely made of cedar posts, and good fence boards all very conveniently arranged, dividing farm into fields containing from five to fifteen acres each, and nearly all so arranged as to be conveniently and bountifully watered at a spring nearly in the center of the farm. The committee would recommend also in this case the use of farm gates. Mr. Beard, the committee are happy to say, is truly a good practical farmer, as every thing on and about his farm bears indisputable testimony. Mr. Beard had some first rate stock and of sufficient quantity for his farm.

The third farm your committee had the pleasure of viewing was Mr. Luther Baker's in the town of LaFayette, containing 100 acres. Found Mr. Baker very cordial and friendly, and giving much promise of profitable improvement upon his farm. He is doing much to improve sheep in the county, which object is commendable and even praiseworthy; we would encourage him in his laudable efforts for improvement, as he is getting his farm up in a nice and profitable manner.

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The fourth farm viewed by your committee was by the request of J. C. Garrett, in the town of Salina; and must report, that although Mr. Garrett has done much to improve his farm, much remains to be done, and the committee would humbly but earnestly recommend him to continue improvement and persist in well doing as he will be sure to reap a rich reward.

The fifth farm viewed by your committee was P. H. Hinsdell's, in the town of Clay. Arrangements of farm buildings first class, farm well arranged, crops generally looking well; contains 130 acres, about 100 acres improved, farm very clean, showing that Mr. Hinsdell is a man understanding his business, and properly applying his energies. Every thing apparently giving unmistakable evidence of thrift and domestic happiness. Mr. Hinsdell has a wind mill erected at his own direction and principally according to his own plan, which is made to pump water for the supply of his farm, which he says works admirably.

The sixth farm viewed by your committee was the farm of Miles Adams, in the town of Salina, containing 131 acres, about 100 acres improved. General appearance of farm and fixtures very good, sixteen acres winter wheat not first rate, fifteen acres of winter rye looks very finely, fifteen acres potatoes very fine, fifteen acres of oats, six acres meadow, heavy crop; has very good stock and a sufficient amount for size of farm. Has owned the farm sixteen years, took it not the best improved, and the condition and profit from the farm give unimpeachable evidence of the sure results of a farmer attending to his business assiduously and intelligently.

The seventh farm your committee viewed was owned by Mr. Thomas Rhoades, in the town of Elbridge, and we took minutes of his farm, but on being informed by a member of the town committee that the owner of this profitable farm has not become a member of your association, your committee do not feel themselves called upon to make any further report.

The eighth farm your committee visited was Capt. David Preston's in the town of Elbridge, containing 270 acres; 240 acres under improvement. Winter wheat considerably injured by the insects, fourteen acres barley very good, twelve acres oats good, forty acres corn, thirty-six acres meadow very large, about forty-six acres pasture, twenty-four head of cattle, two hundred sheep of excellent grade, three pounds nine ounces fleece for the average weight, keeps farm accounts. Balance in favor of farm, $2,000

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last year. In examining Capt. Preston's farm, your committee were forcibly reminded of the fact that a man's business will certainly reward him that attends to his own business.

The ninth farm your committee viewed, belongs to Abram Wright, of Elbridge, containing 180 acres; about 150 acres improved, and very well improved; about 600 rods stone fence of quarry stone. Twelve acres winter wheat, promising very well, nine acres winter rye, large, fourteen acres spring wheat, very good, twenty acres corn, rather light, fifteen acres corn, good, two acres carrots, looking very nicely, thirteen head of cattle, looking as if they were well cared for, one hundred and forty sheep, of the choice variety, average weight of fleece, four pounds. Keeps farm account, but did not give us the balance of accounts. Mr. Wright's buildings are of the first class, and all things appear very thrifty, and everything in its proper place.

The tenth farm viewed by your committee is owned by Mr. Henry Hale, of Elbridge, containing 200 acres; about 140 acres improved, twelve acres winter wheat, promising very well; nine acres of oats, eighteen acres corn, good; one and a half acres potatoes, about thirty-five acres pasture, twenty-six head of cattle, looking finely, five horses, seventy-six sheep, average weight of fleece four pounds. Mr. Hale's farm is well improved, and by his good and systematic management, his farm is being steadily and healthfully improved, and made more and more profitable annually. Keeps partial farm accounts, the balance sheet showing in favor of farm one thousand dollars.

The eleventh farm viewed is owned by Mr. Nathan Crossman, in the town of Elbridge, containing 195 acres; twenty-five acres of winter wheat, looking very promising indeed, (since informed by Mr. Crossman that it yielded about twenty bushels per acre,) about 180 acres improved, and very nicely and systematically managed for profit and cleanliness and order; twenty-five acres of corn, mostly very good; six acres barley, very fine; ten acres oats, very large; one acre potatoes; forty acres meadow, very clean and fine; forty-five acres of pasture; 8 cows, one pair of oxen, thirty-two head of young cattle, eighty-nine sheep, average weight of fleece, 4¼ lbs. Fixtures all in good taste, and fine order, exhibiting the unmistakable result of good practical farming.

The twelfth farm visited by your committee, situated in the town of Skaneateles, owned by Mr. Samuel Underhill, contain-

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ing 130 acres, improved and systematically managed. Although Mr. Underhill was understood by the committee not to enter his farm to compete for the premium so meager of funds offered by your Society, yet your committee decided that very favorable mention shonld be made, by your committee, saying that the improvements presented are really commendable, and make an exhibit of the benefits of agricultural progress.

Your committee, in coming to a decision, have unanimously decided to award your offered premium for the best cultivated farm containing fifty to one hundred acres, to Mr. David Beard of Pompey.

They have also unanimously decided to award your premium for the best cultivated farm containing 100 acres and more, to Mr. Miles Adams of Salina.

SQUIRE M. BROWN,
DAVID S. EARLE,
ELIJAH CLARK,
Judges.

At the annual meeting, January 25th, premiums were awarded on broom corn, 3,370 lbs and 51 bushels seed per acre. On hops, 854 lbs., on half acre.

The Treasurer's account was presented and audited. The Society then proceeded to re-organise under the law of 1855—and the following officers were elected, and the necessary papers prepared for the new organization.

President, Squire M. Brown, Elbridge; Vice-Presidents, Perry H. Hinsdell, Clay; B. J. Cowles, Otisco; Secretary, H. D. Didama, Salina; Treasurer, W. R. Strong, Syracuse; Directors—D. L. Packard, Thomas W. Hill, J. G. Kendall, Alfred Cobb, Morris Beard, John M. Strong.

Receipts during the year, from all sources, ...		$3,335 13
Premiums paid,.....	$888 64	
For all other purposes, including erections upon the grounds,.....	2,171 18	
Balance in Treasury, ...	275 35	
		$3,335 13

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ONTARIO.

I beg leave to submit the following abstract of the workings of the Ontario County Agricultural Society. This is compiled from documents, that but recently came to my hands.

The death of our late Recording Secretary, Mr. John S. Bates, which occurred on the eve of our last autumnal exhibition, of necessity caused some irregularity and confusion in the work of the period—which it is now difficult to remedy.

But it is certain that the success of the Society for the year 1855, has been as great as could have been anticipated by the most enthusiastic of its supporters.

Since the fall exhibition of 1854, the Society have enlarged their grounds to the extent of ten acres, which have been well underdrained, and by that process, a large part of the land which was formerly low and swampy, has been made the dryest and most productive of any portion of the lot. During the year, permanent offices for the transaction of the business of the Society, have been erected and painted; a course for the display of horses, one-third of a mile round, has been graded and prepared; while conveniences and accommodations for stock have not been overlooked.

The attendance upon the fall exhibition of 1855, was greater than at any previous year; and the entries, under the various classes, with scarcely an exception, were more numerous than heretofore. The show of horses and cattle was all marked by a gratifying progress; and the exhibition of fruit, particularly, attracted great attention.

The receipts for the year 1855, were as follows:

Life members,.....	$740 00
Annual members, ...	442 00
Shilling tickets,.....	648 81
Other sources,.....	385 10
	$2,215 91

During the same year, the Society expended $650 in fitting their grounds, laying pipes for conducting water from living springs into large reservoirs for the use of stock, and various other improvements.

Great inconvenience arises from the fact that the tents used by the Society, afford but poor protection to exhibitors, and no

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accommodation for visitors. Arrangements, therefore, are now being made to erect a covered amphitheater, overlooking the judges' stand, and capable of seating three thousand people.

This will afford visitors a shelter and resting place, in the center of which will be exhibited all the stock; and the farmer from a distance, will be certain to find comfortable shelter for his family and himself, no matter what may be the state of the weather.

The design comprises also the addition of rooms for the exhibition of vegetables, fruits, flowers, and all the variety of domestic manufacture, as well as offices for the business of the Society, committees, and refreshment rooms.

If the plan can be carried out, and from the favor with which the proposal is received, there is but little doubt but that it will be, the people of the county will have an agreeable resort, the yearly meetings made more pleasant, and the efficiency of the Society greatly increased.

The premiums awarded last year (1855,) amount to $490.15 in money, and seventy-five volumes of agricultural books.

At the winter meeting, held on the 6th instant, premiums in money to the amount of $98, and thirteen volumes of agricultural books were distributed.

These premiums were about equally divided on cultivated farms, fat cattle, sheep, and seeds.

The first premium on farms was awarded to Mr. E. M. Bradley, of East Bloomfield; the second to Mr. William Johnson, of Seneca; and the third to Mr. R. A. Andrews, of Bristol.

I submit such extracts from the reports of these gentlemen as are likely to be of general interest.

Mr. Bradley says: "My farm is ninety-five acres, of which eight acres are timber and two waste. The tillable land is divided into six-acre fields, and subjected to the following rotation:

First year, manured upon a grass sod forty loads common barn-yard manure to the acre, plowed from six to nine inches deep, thoroughly harrowed, and planted with corn.

Second year, plowed a little deeper than for corn, and sowed to oats.

Third year, in the fall, plowed a little deeper than for oats and sowed to wheat, and seeded down; remains in grass three years, and then is again put through the same rotation.

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Plaster is liberally applied to all my crops except oats; all the ashes made upon the farm, and one hundred bushels more, are annually applied to the corn and root crops.

Have used the sub-soil plow occasionally, with good results.

The following is the amount of seed I use per acre: Wheat, broad cast by hand, two bushels; oats sowed the same, three bushels; corn planted five kernals in a hill, three and a quarter feet apart each way, will be about one-third bushel per acre; herds grass sowed by hand in the fall, one-quarter bushel; clover sowed by hand in early spring, one-quarter bushel; orchard grass by hand in early spring, from one to two bushels, red top mixed with other seed as required; carrots, two pounds per acre, sown with a garden drill; beets same, five pounds per acre; potatoes, from eight to twelve bushels per acre, planted as corn.

My yield of hay is from one and a half to two tons per acre.

Think the Short-horned Durhams, will give more milk, make more butter, and *many more* pounds of beef, on a given amount of food, and in a given time, than any other breed of cattle; I have a Durham cow weighing 1600 lbs, that gives milk to a large calf, and has been milked once a day through the season, and keeps in thriving condition, *on less* than a grade cow in my yard weighing 800 lbs, and giving eight quarts of milk per day. My cattle young and old are all supplied with warm stables, and fed upon roots, corn and oat meal, corn stalks, and straw, are well curried every day, and let out of the barn for exercise, water and air, about four hours each day. Average expense of keeping milch cows and oxen, about $1.25 per week, young stock from 37½ to $1.00 per week.

I keep the Cotswold and South Down varieties of sheep, the former yielding about eight pounds wool per head, the latter about three and a half pounds; sells usually ten cents per pound less than Merino wool. Lambs at weaning time bring from $2.50 to $4.00 from the butcher. Consider the long and middle wooled varieties the most profitable. The cost of wintering is from 75 cents to $1.12½ per head.

Think the making of pork unprofitable, and keep no more hogs, than will consume the slops of the kitchen and dairy.

My fruit trees are spaded about several times each season, and then enriched with fermented manure and ashes.

Gross receipts of my farm, ...	$2,326 48
Cost of working, ...	1,511 90
In favor of the farm,.....	$841 58

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Mr. William Johnson says: "My farm consists of 100 acres, sixteen of which is wood, and four roads, no waste land. I plow from six to eleven inches deep, being governed by the depth of previous plowing and crops to be grown, guided by these considerations, deep plowing has a good effect, increasing the crops fifteen to twenty per cent. I have never used the sub-soil plow.

Underdraining on my farm has been attended with the very best effects, causing the wet places *to become dry*, and the barren places to bring forth fruit in season.

I have used lime, and leached as well as unleached ashes on wheat with decided benefit. On corn I use plaster and ashes, on clover and barley plaster alone, all with good results.

I use a drill to put in my wheat, sowing one and a half to two bushels to the acre. Corn I plant by hand, three and a half feet apart each way, with from three to five grains in the hill.

I sow broadcast from two and a half to three bushels of barley per acre. I this year (1855) planted a nine acre lot to corn, on which, (contrary to my usual practice,) corn had been planted the year previous. Plowed seven inches deep, cultivated once, and harrowed once, then put on nine loads of manure to the acre, spread and plowed under, planted on 25th May, rows three feet two inches apart each way. When up, thinned out to three stalks in the hill, put a handful equal parts ashes and plaster to each hill. Soon as the rows could be seen, passed between with cultivator each way; week later passed cultivator one way, followed with hoe, the rest of the work done with a horse hoe.

Entering the labor and expense correctly, I find the following result:

Cost of working the nine acres, ...		$217 25
Product of the nine acres, 38,671 pounds shelled corn, or 76 40-56 bushels per acre, at 75 cents is,	$517 50	
Value of stalks, ...	38 50	
		$555 00
Profit on the nine acres, ...		$337 75

On the 1st and 2d September 1854, I sowed eight acres wheat, previous crop barley, plowed once, cultivated once, harrowed once, manure to the acre six loads fine. Seed drilled in two bushels to the acre.

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The produce of the lot was 168 bushels wheat at $1.75,	$294 00
Value of straw,	24 00
	$318 00
Expense of working,	158 90
Profit on eight acres,	$159 10

On a field of nine acres, not thoroughly underdrained, I sowed barley. One half of the lot was plowed in the fall, balance in the spring, with no perceptible difference in the crop on the respective portions.

The product was 171 bushels, value,	$197 72
Expense of working,	84 16
Profit,	$113 56

I consider timothy, June grass, White clover, and Kentucky blue grass, the best for the dairy, my yield of hay will average one and a half tons per acre.

Pigeon weed and Canada thistles are most troublesome on my farm. To eradicate the latter, I plow deep and often, sow to wheat, seed down, and mow twice the following season, which generally uses them up.

Red root or Pigeon weed is not so easily managed; the only effectual way is to pull up by the root before it goes to seed. For the dairy I buy or raise only the best animals that can be found, keeping only such as prove good after trial. In this way I have improved the color, form, and milking qualities of my cows very much.

I *summer* my cattle well, believing this to be half towards wintering them. They are housed as soon as pasture fails, or as soon as the nights are cold; then fed night and morning. In winter they are kept in warm stables 18 to 20 hours out of 24; fed on corn stalks and straw cut fine, adding about six quarts shorts, (or ground feed) for each animal per day.

Fed this way with as much as they will eat, and no more, I estimate they cost me about 37 1-2 cents per head per week.

My cows average 200 to 210 pounds butter each, which, from repeated experiments, I am satisfied costs me about 12 1-2 cents per pound, the market price in Geneva last year was from 20 to 25 cents per pound.

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Spanish Merino sheep are my choice; the yield of wool per head was 3 3-4 pounds, sold at 42 cents per pound. As near as I can come to any estimate, it costs about 75 cents per head to winter sheep, varying of course, with the price of feed.

My swine are a cross between Leicestershire and Suffolk. I keep from six to twelve, according to the number of cows in my dairy. Feed: refuse apples, small potatoes, with slops from the dairy and kitchen until September, when I add meal until they are slaughtered, say 1st January, they are then 9 to 10 months old, and weigh when dressed 250 pounds on the average.

I keep the ground well cultivated around my fruit trees, and use for manure a compost of muck, ashes, surface soil, and barn yard manure; pruning annually, and protecting from insects as I best can.

Total receipts from all products of the farm,.....	$3,006 26
Disbursements, ...	2,192 76
Balance in favor of farm,.....	$813 50

Mr. Johnson speaks highly of underdraining, and promises a good account of its effects the coming year. He has just underdrained a nine acre lot, (formerly very wet and almost useless,) at an expense of $234.20, and is so well satisfied with its present appearance, and the disappearance of the water from its surface, that he does not hesitate to express his belief that the yield of corn from it the next year will be as good as any on his farm.*

Mr. Royal A. Andrews, of Bristol, to whom was awarded the third premium says:

"My farm consists of 145 acres; of which 50 acres are wood, five acres road and waste, and ninety acres improved.

My soil is good for grass or grain, and I leave it in grass as long as it does well; then plow in a coat of manure, raise one crop of corn, follow with barley, then seed down to grass again; at least this is the way I manage land designed for meadow.

For wheat, I plow about midsummer, plowing in what manure I can; I drag and cultivate the surface to keep it clean from grass and weeds, and sow my wheat middle of September. I prefer to sow with a drill.

The following spring I sow from six to eight quarts grass seed—say 2-3 clover, to 1-3 timothy, to the acre.

* Vide Mr. Johnson's Statement ante page 254

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I believe in under-draining. In a field of twelve acres, I laid 160 rods of drain, just before putting in my seed last spring, and think I harvested equal to a good acre more of corn, than I should have done without draining.

Have not used lime, guano or salt for manure; have used ashes and plaster, the latter, on clover, with very good effect; have tried it on wheat, but could see no benefit.

I put a tablespoonful of ashes on each hill of corn just before or soon after the corn comes up; it gives it a dark color, and does it good; have put ashes in the hill with potatoes, but can not speak positively as to the result; am inclined to believe it prevents rot to some extent.

I can not say that I do not raise as many kinds of grass as Gov. Wright spoke of in his address before the State Agricultural Society, but I sow only three or four kinds of seed. For pasture, I sow four quarts red clover, and two quarts of timothy per acre. For meadow, I sow four quarts of timothy, and two quarts of clover. For dairy purposes I prefer old pastures of red top, white clover and timothy.

I cut twenty-two acres of grass; yield, per acre, one and a half tons.

Canada thistles are very prevalent; have tried plowing and mowing with but little success; but in dry seasons have cleared them from some of my fields, by going over with a plow once a month; but in general I find the best way to get rid of them is to make the ground rich, and seed it down to meadow; they will not thrive where grass grows stout and thick.

I estimate the cost of wintering my cattle at 70c per head, per week; and of my sheep, at $1.25 per head the winter.

Not keeping any daily farm accounts, I can not give the receipts, nor cost of working my farm. Nevertheless, I think the practice would conduce to close observation, and to one capable of doing it quickly, better his fortune.

These are the items of most interest, which I condense from the reports of the gentlemen to whom were awarded the farm premiums offered by our Society.

If, by any organization through our county societies, it was possible to get the statistics of farm produce from the working farmer, I think much advantage would be derived from it. For then we could see whether that branch of our national industry is progressing or not in our county localities, and also whether there is not room for much further development in agricultural progress.

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We have but few manufactories in our section, and no mines. Our local industry is therefore confined to shop keeping or the farm. And if the utmost limit of farm production has been reached, we must not be surprised if the generation coming on the field crowd to large cities, or look westward.

Any means that can be adopted to check the spirit of roving—to surround the home of the farmer's son with charms which will be more attractive than the glitter of city life, deserve our earnest support.

But, first of all, the farmer's boy must feel that the neighborhood of his father's roof must be able to supply him as well as his father with the means of living. This once certain, the surroundings of cultivation, the comforts and enjoyments of an advanced and cultivated society, will be found the best counterpoise to the adventurous and restless movement of our rural population, which, like other employments in our social fabric, has constantly blazoned before its eyes, "Excelsior."

J. W. HOLBERTON, *Secretary.*

ORLEANS.

The annual fair was held at Albion, September 26th and 27th, and as a whole, was fully equal to any previous exhibition.

Receipts from last year,	$192 36
" during the year,	368 27
	$560 63
Disbursements,	447 22
Balance on hand,	$113 41

Cash premiums of $318.25 were paid, and a large number of agricultural books were awarded in addition as premiums.

The display of horses, for which this county is somewhat celebrated, was very creditable, and sustained the reputation of the county.

A large number of improved cattle of the different breeds have been introduced into the county, and the stock of the county has within four or five years very much improved. The show was good, and competition very spirited.

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The annual address, by the Rev. Mr. Austin, of Kendal, was highly interesting and instructive, and was received with marked approbation by a large audience of farmers and others.

Officers for 1856.—President, Oliver M. Barber, Gaines; Corresponding Secretary, Arad Thomas, Albion; Recording Secretary, Hiram S. Goff, Albion; Treasurer, Edwin R. Reynolds, Albion. J. H. WHITE, *Secretary*

OSWEGO

The sixteenth annual fair and cattle show was held at Mexico on the 26th and 27th of September, 1855. The attendance, for this county, was very large, and the fair promised to be one of the most successful since our organization. The fair ground was commodious and convenient to the village. It was enclosed by a tight board fence six feet high. Two temporary buildings were erected on the ground; one was one hundred feet long, for agricultural products and implements, and the other seventy-five feet long, for the ladies' department, horticulture, fruit, &c. Forage was furnished free for the stock of the exhibitors by the Society. The stock and articles were required to remain on the ground during the exhibition, unless the president granted a permit for removal. This makes the second day of the fair fully equal to the first. The objection, that persons often get the premium instead of the article exhibited, has induced our Society to adopt the plan of having the articles numbered, and not have the name of the owner put on them, and have the premiums awarded to the numbers; and then, as the premiums are read off to such numbers, the owners will give their names. The plan has thus far worked well.

Our Society is in a flourishing condition, with considerable surplus funds to swell the premiums of the ensuing year. We are not prepared at present to favor a permanent location for the State fair. I am not prepared to answer the questions your circular proposed; but will say that the products of our county are chiefly hay, corn, oats, buckwheat, and apples.

Extract from report of I. N. HOLMES, *President*.

THE SECRETARY AND TREASURER ALSO REPORT,

In October, at the annual meeting of the Society, it was resolved that a committee of five be appointed to report at a subsequent meeting, the propriety of dissolving the present organization of

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the Society, and re-organizing the same under the act to facilitate the forming of agricultural and horticultural Societies, passed April 13, 1855. The Society at this meeting awarded premiums on *Indian* corn, Leander Parkhurst of Colosse, 96 1-2 bushels per acre; barley, Jesse Babcock, Volney, 95 1-2 bushels 2 1-16 acres; spring wheat, Jesse Babcock, Volney, 50 1-2 bushels on 2 acres.

RECEIPTS AND DISBURSEMENTS.

Memberships,		$338 72
Admission fees,		236 71
Received from State,		131 00
J. N. Holmes, surplus 1854,		2 22
		$708 65
Premiums paid,	$183 01	
Fixing grounds,	236 71	
J. N. Holmes, old bills,	69 42	
Sundries,	41 51	
		530 65
Balance,		$178 00

The Society agreed to meet at Mexico, December 27, at which time the meeting was held; and the committee appointed reported in favor of dissolving the Society, and reorganising under the new law, which was adopted, and a committee appointed to report the names of officers. The following names were reported: Joel Turrell, Oswego, President; Harvey Palmer, Parish, Vice-president; Avery W. Severance, New-Haven, Secretary; Luther H. Conklin, Mexico, Treasnrer; Directors, Jarvis N. Dewey, Rich land; Abner Lawrence, Mexico; Moses A Wood, Palermo; Norman Rowe, New-Haven; K. E. Sanford, Volney; Robert Oliver, Oswego.

A certificate was drawn up, pursuant to the act of 1855, and signed by thirty-six persons, embracing the names of the persons above as officers, and the form was filed in the office of the Secretary of State and county clerk.

On the 23d January 1856, a code of by-laws was adopted, and the fair located at Mexico, and a suitable lot of land, not exceeding fifteen acres was directed to be purchased by the board of managers.

Extract from report.

A. W. SEVERANCE, *Sec'y.*
L. H. CONKLIN, *Treasurer.*

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OTSEGO.

I herewith submit to you, the report of the Otsego County Agricultural Society, for the year 1855, it being the third annual report that I have had the pleasure of transmitting as presiding officer. In the first place, I am happy to congratulate with you, the success which has crowned the efforts of those few individuals who have labored long, ardently and devotedly, for the cause of agriculture, and the mechanic arts in the State of New-York.

In offering this report, I shall endeavor to do no more than justice to the county I represent, which will have some statistical accounts that may be interesting.

Otsego county is inland and isolated, touching no points on any canal or navigable waters, and not even within fifteen miles of a railroad at its nearest point; and some portions over fifty miles distant from any. This county is about fifty miles in length, north and south, and nearly thirty in width—east and west. Its northern portion is situated on the height of table land, which divides the confluence of the head waters of the Susquehanna and its tributaries, running south to the Chesepeake, and the northern dip to the Mohawk, which runs east to the Hudson, and then turns south, and is a major branch of that noble river. Otsego and Canaderago or Schuyler's lake, are in the northern part of this county; the scenery of these fine sheets of water perhaps is not excelled in the whole State, being situated nearly two thousand feet above tide water. This county contains 578,162 acres of land; 376,868 of which is under improvement, valued at near thirteen and a half millions of dollars. Its present population is 49,735, being entirely an agricultural district, not having any large villages or extensive manufactories to make even a home market for the smallest amount of its produce, all which has to be carried by teams either to Albany or to some point on the Central railroad, which, in itself is a heavy tax on the producer.

It contains 4,767 farms; with a stock of 12,000 horses, 58,000 neat cattle, 108,000 sheep, and 26,000 swine. It produces 4,547,577 pounds of butter and cheese; and there is only four counties in the State produces more of this article, viz: Lewis, Jefferson, Herkimer and Oneida; two of these counties contain 100,000 more acres than Otsego; the other two contain less. Another item of produce is hops: for quantity and quality this county is known and far-famed both in America and in Europe.

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By the census of 1850, the county of Otsego raised 1,132,062 lbs. I think the quantity has now increased to one and a half millions. (And now allow me to notice a discrepancy which occurred in our report last year, to you of our Society, and a report of mine in answer to a circular for a statement of the agricultural resources of the county;) in the report of the Society, the county of Otsego is shown to raise 2,000,000 of lbs., when there is only three and a half millions raised in the United States.

In my answer to your circular, it is shown to raise 800,000 lbs. Now a careful observer will readily see by examining the report of the Otsego County Agricultural Society, in the Transactions of 1854, contained on page 572 to 576 inclusive, and then examine my answer to your circular contained on pages 576 to 581 inclusive, and compare those statements with the last census, it will be readily seen that the former report is not correct. And although the latter may not be perfect to a minutia, yet it will be seen to be very near accurate in the statement of this crop in the county. Again, to show the inconsistency of the former report, there is but 4,764 farms in the county. That report gives to the hop-growers (said to cultivate in hops 2,000 acres) $600,000 just for hops alone. Now this would give to each farmer in the county $1,250, or a fraction less than twelve hundred and fifty-one dollars to each farm in the county, just for hops alone. As we have stated above, there is in this county 558,162 acres of land, and 4,764 farms, making an average of a fraction over 115 acres to each farm, it is not hardly supposable, that each of these farms will average the above amount even with all their products.

There is in this county nearly or quite 100,000 sheep, which is another source of profit to the farmer; these sheep will clip about 300,000 lbs. of wool, which will bring to their owners $90,000, and perhaps $20,000 more for their increase; now all this and the cerials, grain, fruit, poultry, beef and pork, has to be carried to a distant market. These items will show the need and utility of having the proposed railroad speedily built from Binghamton to Albany, which has its course through the south and southeast part of this county.

It cannot be doubted but that the county of Otsego is advancing in agriculture and the mechanic arts—the improvement of stock is on the gain; there is, in general, a growing taste for dwellings and outbuildings, and of laying out farms; and there

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was certainly more of this spirit manifest at our last fair, than was ever before witnessed in our county.

J. W. BALL, *President.*

Officers for 1856.—Francis M. Rotch, President; Alfred Clarke, Vice-President; Jerome B. Wood, Secretary; G. Pomeroy Keese, Treasurer; Henry Roseboom, Jacob C. Rathbun, Kenneth G. White, Wm. Davison, Limus N. Chapin, and R. H.Van Rensselaer, Directors.

PUTNAM.

The annual exhibition was held in the town of Carmel on the 18th and 19th of September. It far exceeded even the anticipations of its most sanguine friends. On the part of many it was feared that we were trying one place of location too often—or, in plainer terms, those who on former occasions, and who must again be taxed, would come to the conclusion that the ex-board had never heard of riding a free horse to death—but the result fully demonstrated that we had well chosen our grounds.

The show of fat cattle exceeded by far anything ever presented at a county fair, there being on the grounds two lots of forty and sixty each, of fat bullocks, averaging from eight hundred to a thousand pounds per head ; and then there were several smaller lots and single head of greater weight. The working cattle, as usual, though not numerous, were very fine.

Dairy stock was not as well represented as in former years ; this I attribute to the influence of the milk business, which induces farmers to buy from droves, and not waiting to raise their own stock—a practice, in my opinion, the most destructive of systematic farm thrift.

The plowing match was unusually attractive, and it was gratifying to see the interest of spectators and the emulation of competitors. I regard this as one of the most important branches of our affairs, and I think no pains should be spared to lead the attention of farmers to this fact. Thus far my observation has taught me, that we have many who are familiar with the use of the implement and the government of the team; but when and in what manner this means of pulverization is to be applied to the various localities and soils becomes a question. The very diversity of opinion that arises tells us we are ignorant, we have no guide, at least in the ranks of the working men.

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The special premium list, which you have observed as forming part of our premium list, elicited considerable competition in the various departments taken up. Still regarding it as calculated to depreciate the standard of the Society's premiums, and to engender the one idea of a money value to the premium, I can't but feel it must eventually depreciate the best and wearing interests of our little Society. The majority of the officers of the Society, however, do not agree with me, so I presume it will appear again.

Our show of garden vegetables was very superior both in quality and variety to any former exhibition, and the tent set forth a fine display of flowers and household manufactures.

Officers for 1856.—President, Thos. B. Arden, Philipstown; Vice-Presidents, L. D. Clift, Carmel; Chas. W. Hine, Southeast; Jas. O. Towner, Patterson; Coleman Townsend, Kent; Ezekiel Hyatt, Putnam Valley; Arvy Hill, Philipstown; Secretary, G. M. Belden; Treasurer, Saxton Smith.

The treasurer's accounts stand as follows:

Receipts:	
Balance in treasury,	$461 62
Cash from all sources,	398 44
	$860 06
Expenditures:	
Premiums and expenses,	708 18
Balance in hands of treasurer,	$151 88

THOS. B. ARDEN, *President.*

QUEENS.

The annual fair was held at Flushing, September 20. It was the most successful exhibition ever held by the Society. The number of visitors was exceedingly large. Not a single case of intoxication was seen, nor an unpleasant incident occurred.

The show of cattle was the best ever seen in the county and competition very close.

The show of horses also surpassed that of any former year, both as regards number and quality. Sheep finer than usual. Swine, a very large number and of superior breeds.

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The show of poultry was inferior to former exhibitions. The Shanghai fever has abated.

Of vegetables—the largest display since the organization of the Society, and quality very superior.

The fruit shown filled a tent fifty by eighty feet, and was a very creditable display. The exhibition of flowers was very attractive.

Butter was inferior to former shows.

The show of bread was good. A premium was awarded (pa[illegible] of silver butter knives,) to Mrs. I. G. Moore, Hempstead, f[illegible] bread made of Indian meal and rye flour, from the following recipe. It was pronounced by the judges excellent.

"To three pints of Indian meal and three pints of unbolted rye flour, add one cup of molasses, a cup of yeast and a little salt; add warm water and stir the mixture to the consistency of soft dough; bake in earthen or iron pan, with another covering it, for twelve hours, in a slow oven."

Mowing machines.—A trial of mowing machines was held in July, on the farm of Edward A. Lawrence, Flushing, five entries. The committee decided that Manney's improved, and Ketchum's were equal for work performed; but Manney's the lightest draught; and the premium was awarded to Manney's improved mower.

The annual address was delivered by Hon. George W. Clinton, of Buffalo, who was introduced by the President, Hon. John A. King, in an effective and highly complimentary speech.

The address was enthusiastically received and a copy solicited for publication.

The annual meeting for election of officers, was held Dec'r 10. Hon. John A. King requested that he might not be deemed a candidate—and made a very pertinent address and nominated his successor.

The thanks of the Society were unanimously tendered to Mr. King for the interest and zeal manifested in the welfare of the Society, and for the ability and fidelity with which he has discharged the duties of presiding officer.

A committee was appointed to receive any communication from the county of Kings in reference to the two counties uniting in one agricultural society.

Officers, 1856.—Hon. Wm. T. McCoun, Oyster Bay, President. Corresponding Secretary and Treasurer, John Harold, Hempstead; six Vice-Presidents and six managers; Recording Secretary, John H. Seaman, Hempstead.

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Receipts,	$1,292 05
Premiums and expenses,	1,149 84
	$142 21

Upwards of 4,000 packages of seeds from Patent Office, distributed during year; 510 volumes of books have been purchased and donated to the Society for premiums and distribution.

Extract from report. JOHN HAROLD, *Cor. Sec'y.*

CLIMATE OF LONG ISLAND.

Although not coming strictly within the limits of the transactions of our county society, but for comparison with other parts of the State, I subjoin a semi-annual statement of the temperature of the county of Queens, for the six months ending December 31st, 1855.

The mean temperature of the different months were as follows:

Month.	Maximum	Minimum.	Range.	Average.
July,	83.88	69.58	14.03	76.73
August,	78.06	62.21	16.39	70.04
September,	74.35	55.93	18.42	65.14
October,	58.64	42.06	16.58	50.35
November,	49.33	34.04	15.29	41.68
December,	37.12	23.58	13.54	30.35

Average temperature of the six months:

Maximum.	Minimum.	Range.	Mean.
63.65	47.09	15.75	55.78

The decline in the mean temperature, from month to month, was:

From July to August,	6.33	degrees.
August to September,	5.26	"
September to October,	14.79	"
October to November,	8.67	"
November to December,	11.33	"
The entire change from July to December, was	46.38	"

The warmest days were as follows:

Month and day.	Temperature.
July 19th,	96½ degrees.
August 4th,	86 "
September 12th,	87¾ "
October 5th,	76 "
November 16th,	64 "
December 9th,	58 "

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The 9th, 12th and 18th of September, were hotter than the warmest day in August—the latter month having been remarkably cool during the past year.

The coldest days were as follows:

July 21st,	60	degrees.
August 18th,	52	"
September 19th,	43¾	"
October 25th,	32	"
November 22nd,	17½	"
December 13th,	7½	"

The greatest range of temperature in each month, viz:

July,	36½	degrees.
August,	34	"
September,	44	"
October,	44	"
November,	46½	"
December,	50½	"

On the hottest day of the entire six months the mercury reached 96½, while on the coldest day the minimum temperature was but 7½ degrees—thus making the greatest range in the six months 89½ degrees. The day in which the range of temperature was the greatest, was the 18th of September, when it reached as high as 38 degrees, while on the 20th of October, when it reached the least, it was but 3½. The fall from the *maximum* temperature of the 18th of September to the *maximum* of the 19th, was 25 degrees; while that from the *maximum* of the former to the *minimum* of the latter was, or the change in only thirty-six hours 43¼ degrees.

The number of rainy days are—August, 8; September, 9; October, 15; November, 10; December, 6—making in all forty-eight rainy days since the first of August; which leaves 105, or about two thirds of the whole number dry. Out of twenty-two Sundays in these five months, twelve, or more than one-half were rainy.

JOHN HAROLD, *Cor. Sec'y.*

RENSSELAER.

The annual fair was held on the 18th, 19th and 20th of September, and was one of the most successful held by the Society.

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At the winter meeting, January 15, 1856, premiums were awarded on field crops:

Benjamin Akin of Pittstown, the premium of $10 on flax, and they award him the first premium on the ground of merit, the crop being almost unprecedented in this county, being on one acre and one rod of land fifteen bushels, four quarts of seed, 624 lbs. of flax or lint; expense of production $29.35; amount of sales $98.89. Profit $69.54.

The first premium $8 was awarded to Benjamin Akin, of Pittstown, for an exhibition of spring wheat, a yield of 30 40-60 bushels per acre.

The second premium $6, on spring wheat, to A. R. Fox, of Sandlake, being little short of 30 bushels to the acre.

The first premium $6 on buckwheat was awarded to A. R. Fox, of Sandlake, 80 bushels on 2 47-80 acres.

The committee on sugar beets, carrots, &c., awarded the first premium $5 to Joseph H. Coons, of Brunswick, 220 bushels on one-quarter acre; cost of culture $12.13; value of crop $56.25.

Officers for 1856.—President, Gideon Reynolds, of Hoosick; Vice-Presidents, George Vail, John J. Viele, Hugh Rankin, Daniel Wight, of Troy; H. W. Knickerbocker, Lansingburgh; Treasurer, Abm. Van Tuyl, of Troy; Secretary, William Hagen, of Troy; and seventeen Directors.

Receipts,	$3,493 52
Expenditures,	3,210 52
Balance in treasury,	$283 00

Extract from report of

WM. HAGEN, *Secretary.*

ROCKLAND.

The twelfth annual fair of the Society was held at New City, October 10th and 11th, and was more largely attended than any previous fair.

The exhibition of stock was excellent, though in numbers not equal to some previous exhibitions. The Ayrshire stock of Hon. A. B. Conger, which received first prizes at the State fair at Elmira, were present; and some fine full blood Devons, the property of Col. Isaac Pye.

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Matched horses of extraordinary excellence were shown; and an equestrian match for ladies excited much attention.

The exhibition of vegetables was remarkably good and very extensive.

The Society is in a very prosperous condition; the receipts from members being upwards of one hundred dollars in advance of any previous year. The farmers' buildings, out-buildings, fences, tillage, stock, and every thing pertaining to farm management, shows that a new impulse in the science of agriculture has been given in this county, that has already resulted in much good.

The annual address was delivered by Col. Isaac Sloat, formerly president of this Society; he treated his subject with great skill; and made plain to every hearer, that to be a real farmer, a man must study not only books and papers but the soil itself.

The awards were announced and paid at the close of the address, and more money left on hand than at any previous period.

Officers for 1856.—President, Erastus Johnson, Springvalley; Cor. Secretary, Edward Suffern, Haverstraw; Treasurer, Peter T. Stephens, Clarkstown.

S. W. CANFIELD, *Rec. Sec'y.*

ST. LAWRENCE.

The annual fair was held at Canton on the 25th, 26th, and 27th of September.

The Society, under its present organization, has now been in operation since 1852; holding its annual fairs and exhibitions at the same place, with increased interest, and it is believed, with corresponding beneficial results. The attendance was large, and of the right stamp. The farmers thronged the grounds, while farmers' wives and daughters filled the Floral tent, and graced the extensive gallery which the citizens of the place, aided by the funds of the Society, have erected for the view of the exhibition, trotting course, and the ground it encircles—all were gratified.

The Society distributed $1,476.36 in premiums, to something over three hundred recipients; few of which were awarded without competition; and in all of the principal articles, the competition was such as to make the duties of the committees arduous and embarrassing.

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The county of St. Lawrence, though throughout its extended surface, where cultivated, is capable of producing the usual grains in nearly, if not quite, the abundance and perfection of the western counties of this State, requires more tillage and labor to ensure a crop, from the fact that our soil is so natural to the production of grass that great care and careful attention is necessary to keep it subdued so as not to interfere with sown crops. It is this natural tendency of our soil to the production of grass, which gives direction to our agricultural pursuits, and is destined to give our county a higher rank as a grazing county. Already have our farmers, within the few years since the opening of railway communication with the valley of the St. Lawrence, rapidly increased in wealth from the income of their farms, while the farms have doubled in value.

In the raising of cattle and horses for market, there are as great facilities as in any other county in the State; yet the income of the dairy is so great, increasing, and annually realized, that it engrosses most of our Agricultural capital and efforts.

The temperate character of our summers, the sweetness and luxuriance of the herbage of our pastures, enables our dairymen to produce throughout the season, butter and cheese of the best quality, and has already given to St. Lawrence butter in the Boston market much of reputation of the Goshen butter in New-York.

Notwithstanding the inducements of the farming interests to turn its attention to the dairy, interferes considerably with the raising and improving of stock, the show of cattle at our last fair was decidedly in advance in number and character of any previous year; and while our county can boast of no one agriculturalist who makes it a business to procure and cultivate from bloods of the favorite foreign stocks, we find the Durham, the Devon, and the Ayrshires distributed throughout the county, crossing with each other, or with the native stock, producing in results, a general improvement, leading to further investments and experiments.

In horses, though the show, particularly in matched horses, was fine, and in other classes numerous and good, of the breeds which have lately become favorites, there is evidently less attention than formerly to size and power. The beauty of form and agility of motion of the Black Hawk and Morgan blooded horses being substituted for the larger and more powerful races of the Messenger and Blucher blood, which were once favorites with

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us. A regard to usefulness in the place of fancy, will bring back more or less of the desire to resume the propagating of breeds of somewhat similar character again.

In the products of farm cultivation the last season, the county of St. Lawrence has shared with our country generally in the abundance of its harvests. In all the cereals with the exception of corn, (of which, owing to unfavorable weather, less than usual was planted,) the yield has been large in quantity and excellent in quality; and slightly as we claim to be a wheat growing county, and little comparatively as our farmers bestow their efforts upon that crop, it is believed our county will have a surplus for market of from one hundred to one hundred and fifty thousand bushels.

In the horticultural department the display at the fair was extensive and fine, exhibiting increased attention to the subject. The productions were unusual in size and perfection, and of the character and kind, would compete with any which could be produced in any other part of the State. One article is worthy of special note, as an extraordinary production, a squash weighing 221 3-4 pounds. It was from a seed from the Patent office, obtained from France. It was of fine globular shape, milky white on the outside, and rich orange color within, and was raised by Mr. Woolley of Ogdensburgh, the single vine on which it grew producing altogether near 1000 pounds weight.

In the exhibition of fruit, of needle work, of painting, and in all the miscellaneous variety which filled the floral hall, the exhibition was extensive and gratifying.

The whole was closed with an address from the Hon. Samuel A. Foot, of Geneva, of a highly practical and instructive character, a copy of which accompanies this report.

Besides the cash and honorary premiums awarded by the respective committees at the fair, the Society, at its annual meeting, placed at the disposal of the president and secretary, the sum of one hundred dollars, to be distributed to members of the Society, where most beneficial, in such periodical agricultural publications, as were deemed most useful.

It has enabled them to send into each town connected with the Society through the year, from two to ten weekly publications on agricultural subjects, such as the Country Gentleman, Rural New-Yorker, &c., disseminating the information they contain, and keeping up a continual attention to the improvements and experiments made elsewhere, in their own pursuits in life. The

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general diffusion of agricultural information, including chemical and other sciences applicable to its business, is believed to be preferable to the expending large sums in a single institution, where the knowledge must be local and theoretical. The sciences applied to agriculture are very important, but it is only by practical application the great beneficial results are produced, and no method is more likely to accomplish such purposes, than the continual distribution of information, to those who are in the situation and have the means and the inducements to produce such results.

D. C. JUDSON, *President.*

SARATOGA.

The Saratoga County Agricultural Society has just past the most prosperous year of its existence, and the friends who have stood by and worked for it for many years, were last September gratified at the close of its fair, by the intelligence that the receipts for registry and other tickets, admission to the show grounds, &c., were amply sufficient to pay its list of premiums in full.

The show at the fair was a good average one, and the number of exhibitors was more than double that of the previous year.

We feel much encouraged now to make further efforts for the future, and hope to go on prosperously.

The receipts at the fair compare with last year as follows:

	1855.	1854.
For registry or exhibitors' tickets,	$136 00	$62 00
Members tickets,	230 00	247 00
Single tickets to grounds,	207 83	95 76
	$573 83	$404 76

Excess in 1855, ... $169 07

Officers for 1856.—President, Chauncey Boughton, Half-moon; Vice-Presidents, Nathaniel Mann, Milton; James C. Rice, Mechanicville; Treasurer, Reuben S. Burtis, Halfmoon; Corresponding Secretary, Lewis E. Smith, Halfmoon; Recording Secretary, Edmund J. Huling, Saratoga Springs.

E. J. HULING, *Secretary.*

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SCHOHARIE.

The annual fair of the Schoharie County Agricultural Society was held, for the year 1855, at the village of Middleburgh, on the 10th and 11th of October.

It was manifest, from the large number in attendance at the exhibition, that there is an increasing interest in agricultural matters in this county.

The exhibition of the various animals and articles ordinarily brought out on such occasions, was much larger than usual.

On Thursday afternoon the Society met at the Reformed Dutch Church, Hon. Lyman Sanford in the chair.

The meeting was opened with prayer by Rev. E. M. Vedder.

The address of Judge Rosseter was listened to by a large and gratified audience. It was to the point, and well calculated to stimulate our farmers to increased zeal in their noble work.

Officers for 1856.—President, Perry G. Gardner, Schoharie C. H.; Treasurer and Secretary, James France; and seventeen Vice-Presidents; Executive Committtee, Robert R. Bailey, W. S. Gates, Jacob Vroman, Gideon Shafer, J. S. Waterbury.

The next annual fair to be held at Schoharie Court House.

LYMAN SANFORD, *President.*

SULLIVAN.

The annual fair of the Sullivan County Agricultural Society took place in Monticello, on the 10th and 11th days of October.

The exhibition was equal to any that preceded it. It was somewhat deficient in fruits and vegetables, and perhaps in household products; but the quality of the articles made amends for the lack of quantity. The court-room, which was principally devoted to the hand work of the ladies, was rendered attractive by the fine monochromatic, crayon and oil paintings of Miss. Agnew, a teacher of the Monticello academy; the pelles work of Miss Crary; the artificial flowers manufactured by Mrs. W. C. Low.

Among the agricultural implements exhibited were Ketchum's mowing machine, Ayer's implements, &c. Mr. B. G. Childs exhibited a very ingenious wood and bark rule, (an original invention.)

Major John D. Oneill, a Fallsburgh farmer, had on the ground a team of eight yoke of heavy oxen; and Capt. S. Hamilton of Thompson, had a team of eight yoke of fine four year old steers.

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The address was delivered by Rev. B. G. Adams, and was received with much favor.

The plowing match took place on the 11th, and was largely attended. The first prize was won by James Oneill of Fallsburgh, who plowed one-fourth of an acre in forty minutes.

Officers for 1856.—President, Charles S. Woodward. Vice-Presidents, John A. Swan, Bethel; George G. Dewitt, Callicoon; John Moersch, Cochecton; John D. Oneill, Fallsburgh; Lewis Moore, Forestburgh; Chas. W. Mills, Fremont; David C. Ayers, Highland; Calvert Crary, Liberty; Peter Mills, Lumberland; John A. Morrison, Mamakating; Arthur Palen, Neversink; Edward Livingston, Rockland; Cornelius Hatch, Thompson; Wm. M. Mapes, Tusten. Recording Secretary, E. W. Fairchild. Corresponding Secretary, J. E. Quinlan. Treasurer, Lewis W. Piercy. Executive Committee, Stephen Hamilton, J. Huntington, Richard Oakley, Simon Krum, Thompson; John H. Snyder, O. H. Bush, Fallsburgh.

JAMES E. QUINLAN, *Cor. Sec'y*

SCHUYLER.

The first annual fair of the Society was held at Watkins, September 25th and 26th. The attendance was quite large, and the show of stock and domestic manufactures far exceeded the anticipations of all. Durham, Devon and Grade stock, of excellent quality, were on exhibition. The implement department was very fully represented. Fruit was largely shown, and of the most approved varieties. The dairy was well represented, and the quality of butter very fine.

A very instructive address was delivered by Charles Lee, Esq., of Penn Yan, on the second day of the fair, which was listened to with marked attention.

The Society is much encouraged by this first exhibition, and renewed efforts will be made to increase the interest among farmers and mechanics to sustain the Society and extend its usefulness.

Receipts, ...		$181 02
Premiums,.....	$129 02	
Incidental expenses, ...	52 00	
		$181 02

Money from the State not yet received.

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Officers, 1856.—Daniel Fuller, President, Watkins; Orlando Hurd, Secretary, Dix, (Watkins post office); Thomas Evans, Treasurer, Watkins.

Extract from report. JOHN WOODWARD, *President.*

SENECA.

The sixteenth annual exhibition was held at Farmersville, October 10th, 11th and 12th. On the first day after the tent was raised, the committees were filled, and the articles were arranged in fine order.

The morning of the second day was pleasant, and the grounds were thronged with the multitudes viewing and examining the great variety of articles presented for examination. The committees were actively engaged in the performance of their arduous duties.

The Society was called to order in the afternoon by the President J. W. Bacon, Esq., and after prayer by the Rev. B. Bassler, the address was delivered by Prof. Amos Brown, Principal of Ovid Academy—his subject "The dignity of labor," was most ably treated, and to the great acceptance of the large auditory present; a vote of thanks was tendered to the speaker, and a copy of his address requested for publication.

It was generally conceded that this was one of the best exhibitions ever held by the Society; when it is considered, that the fair was held in a strictly agricultural district, with no village of any considerable size near it, nor any dense population around; it clearly shows, that the farmers are awake to the benefits arising from such exhibitions.

The entries of horses were 164, comprising over 200 animals. The judges say, "That they were highly gratified with the exhibition, and that the number of animals were unusually large and valuable. It is a fact fully demonstrated, that Seneca as a stock grower of this invaluable animal, has already taken her stand among the best of her sister counties. The committee in some instances had much difficulty in deciding between competitors, particularly in the class of three years old and single horses, where all appeared so well."

The entries of cattle were 118, among which were several fine specimens of Devons, Durhams, and other varieties. Of sheep 152 animals were entered; the committee remarked that the

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exhibition of coarse-wooled sheep was unusually large and excellent; and while the coarser grades have improved, the finer wool varieties have deteriorated, which is much to be regretted.

The show of poultry was unusually fine. A very large and splendid variety of pleasure carriages were shown, which did great credit to the manufacturers and to the county.

Pratt & Brother's Ditch Digging machine attracted much attention, and the trial of the machine in a lot adjacent to the fair grounds, was witnessed by large numbers, and the working of the machine appeared satisfactory.

In the household department there was a very good display. A package of butter fifteen months old, which received the premium last year, was examined by the committee who pronounced it nearly as fresh and sweet as when first made.

In the discretionary department were many articles of utility and ornament. The display of insects by M. G. Almy, of Farmerville, together with his bees making honey, attracted much attention. Mr. Almy has some 10,000 varieties of insects and animals, and about 550 alive.

Mr. John Johnston, of Fayette, chairman of the committee on draining, made a valuable report of his operations in draining his farm, which will be found ante page 257.

Receipts and expenditures:

Balance in treasury, Dec. 1854, ...		$718 90
Receipts during the year, ...		1,378 12
		$2,097 02
Paid for premiums, ...	$663 01	
All other expenses, ...	914 69	
		1,577 70
Balance in treasury, ...		$519 32

Field crops reported:

D. D. Lefler, corn, nine acres, 932½ bush. ears, equal	466¼	shelled.
One acre, 253 bush. ears, equal	126½	"
John Ditmas, ten acres corn, 927 bush. 27 lbs. ..	464	"
One acre gave, ...	97	"
W. B. Coryell, 5 acres corn, 785 bush. ears, ...	392½	"

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Officers for 1856.—The Society re-organized under the new law of 1855.—President, J. W. Bacon, of Waterloo; Vice-President, T. Boardman, of Covert; Secretary, Geo. S. Conover, of Varick; Treasurer, S. D. Coe, of Romulus; Directors, G. V. Sacket, of Seneca Falls, Jos. Wright, of Waterloo, John Johnston, of Fayette, John E. Seeley, of Ovid, Wm. F. Coan, of Lodi, Nelson Noble, of Covert.

Extract from report.

GEO. S. CONOVER, *Sec'y.*

STEUBEN.

The Steuben County Agricultural Fair was held at Bath, September 26th, 27th, and 28th. The attendance was large—the exhibition full and interesting. In every department of agricultural and mechanical industry, great interest was manifested to give our third annual fair a prominence and standing among the first in the State. The end was most fully accomplished, resulting in mutual congratulations amid all classes of our citizens.

An exhibition of the products of industry suggests the basis of true greatness and independence. The germ of independence exists in self-confidence and reliance—in the active development and use of the powers and resources with which we are endowed. In Greek mythology we have a beautiful illustration of its growth and development. Hercules impersonated moral energy and enterprise, self-reliance and independence. The use of our own powers of mind and body impart generous and lofty sentiments—high and controling views—force of character—a sense of independence—firmness to meet responsibilities.

They who achieve important results are found to be men possessed of moral power—scientific skill—enlightened judgments—men of active business habits. They do not wield the power of wealth, but a power arising from character in some useful pursuit, and a disciplined experience.

If any fact stands out more prominent than all others in the page of our country's history, it is that success and independence depend on the development and energy of the individual powers of mind, rather than upon extrinsic aids and supports. Individual labor and enterprise have ever contributed to the enjoyment of man. Humble though it be, it goes to swell the mighty aggregate. It is the rill that trickles down the mountain side

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and diffuses fertility throughout the valley. To it we owe our cultivated fields—our abundant crops—our maritime and commercial greatness—our triumphs at home and abroad.

The exhibition in horses was creditable to every part of the county from whence they were entered. Horses adapted for parade and show, with arched crest and high action—horses fitted for the road, for team, or buggy—horses for all work—saddle horses noted for speed "on race" or "trotting match," were exhibited. It was an exciting scene to witness their parade, as brought upon the course for exhibition—to note the skillful training—perfect practice and "artful jockeying"—the application of whip and spur.

Aside from the premium horses, there were many of superior value exhibited, showing skillful training and management.

In Shorthorns and grades there were many entries for competition. It is a gratifying feature in our county fairs to witness the increasing interest manifested to procure fine stock of improved breeds and rearage. But a few years since, any common breed of cattle was deemed "good enough," by the aggregate of our farmers, and our farm yards were filled with a poor, meager display of lean, unsightly herds, promising neither credit nor profit to their proprietors. Many of our farmers deserve particular notice for their enterprise in procuring and rearing improved breeds of cattle; tney deserve the gratitude of their fellow-citizens for introducing to our notice stock of superior grade and value, thereby correcting and improving the public taste and judgment in respect to this branch of agricultural economy. Among these stand first, Henry McElvee, Bath; Uri Balcom, Corning; O. F. Marshall and Wm. Wheeler, Wheeler; and L. Waldo, Prattsburgh.

In "fine wool sheep" our flocks stand unsurpassed in staple or value. They are the results of careful breeding, extended through a series of years, in which the most perfect in fleece and symmetry, and constitution, were always selected—a process, by means of which, man has caused his flocks and herds to participate in his civilization.

POULTRY.

The committee report that the show in poultry has been remarkably small, but a few varieties having been entered either for exhibition or competition. The mania for long-legged roosters is evidently on the wane, proving to your committee the increasing intelligence of the age, and particularly of the

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Steuben agriculturalists. That poultry is an important institution of our country, cannot be doubted, especially when we take into consideration the large number of eggs which are annually consumed in the luxuries of life, and the quantity daily sacrificed to the god of good living. That there are varieties more profitable than others, is not to be doubted; but believing in the doctrine, that Yankees and their improvement cannot be beat, your committee are clearly of the opinion, that Yankee poultry are fully equal in every respect, except bones, to the John Chinaman's Shanghai, or the Bramin's Pootra. The hen that laid the golden egg, has not yet been discovered to have been foreign, and the hen that laid two eggs on week days and three on Sunday is said, on competent authority, to have been Yankee in her origin. Your committee, therefore, with all due deference to the spirits of by-gone humbugs, respectfully recommend, that more attention be paid to the rearing of the common breed of fowls, whereby a great saving will be made from the enormous appetites of a foreign gluttonous race of poultry who eat up our substance without remuneration, and also from the discordant crowing of a biped, whose notes are only excelled in sweetness by the filing of a cross-cut saw.

BUTTER, CHEESE AND HONEY.

The articles presented for competition in this class were generally of superior excellence. The specimens of cheese are mostly of prime quality, and evince a forwardness in this difficult art highly commendable to the manufacturers.

The butter, almost without exception, is of fine color and consistency, and of that peculiarly rich flavor that has given so extended reputation to the product of the Orange county dairy, as to make it the standard of excellence in all the markets of this country, and in many foreign markets.

We would call the attention of butter makers to the leading defects that exist in some of the specimens exhibited. First—In some packages there was evidently an extra exertion in the direction of superior manufacture, which resulted in overdoing the thing. The butter is too much worked; the granulations are broken down, and to use a market phrase, it is left "salvy." Second—In some specimens coarse salt has been used; much of it is undissolved, and in testing it by tasting, that unpleasant sensation is produced, known among butter dealers as "gritting between the teeth." We would recommend to farmers, in the

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manufacture of butter, the exclusive use of pure ground salt—they should use no other. We will not so far impugn their good sense as to suppose that they use coarse salt from motives of economy, as at a glance it must be apparent to them that in the cost of the article but a trifle is saved—but a few pennies upon a firkin, while the loss in the price obtained for the butter is always from two to four cents on each pound; but we attribute the mistake to oversight, or lack of reflection. Shrewd men should not be guilty of such mistakes—they should calculate better, or failing to do so, that sensitive pouch, known in the organism of American population as the *pocket*, must suffer. Third—In some packages we found the milk imperfectly worked out. This is a serious error, and one that must be avoided, or the butter will rapidly become rancid. The milk must be entirely expelled, and care observed on the other hand to avoid the error, quite as serious, above mentioned—of destroying the granulations. Whatever liquid may be present at any time after packing, should be of crystal clearness.

Although the presentation of butter and cheese was about equal to that of other products of the farm, yet your committee, with all others, feeling an interest in agriculture, must regret that it was not ten, twenty, even forty fold greater. Steuben county is peculiarly adapted to its manufacture. Its hills and its valleys produce the finest grasses, rivalling in richness and exuberance the famous pastures of Orange county, and equal in all respects to the most favored grazing districts of the United States. Springs of the purest water bubble up in almost every field. She should not lag in this interest, but should be foremost, leading in the van. She has all the requisites of climate, soil, water, accessibility to markets, intelligence, and capital. She should make butter and cheese extensively, and of the finest quality, for there is money in it, and her farmers should bring it here for exhibition and competition—not for the trifle that the successful are awarded, but to excite interest, stimulate manufacture, and for the honor of Old Steuben.

Among the most gratifying features of the exhibition were the indications that home manufactures have not entirely forsaken the farm-house, but that the good old "in-door" and "fire-side" occupations yet linger in our midst, as tokens of bygone days of frugal "*house-wiferie.*" In this progressive age of embellishments and display, in which idle etiquette has usurped the more substantial occupations in life, we put on record, and

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hold in grateful remembrance, the names of those ladies who, by their needles or looms, filled and graced the *domestic* department of the exhibition.

One of the most useful inventions exhibited at the fair was C. R. Barnes' *Rice Huller*. It is a great improvement on all machines for hulling all kinds of grain having a husk, throwing the grain upon the longest diameter, and stripping it entirely of all husk and other foul attachments. It will cleanse the common black rye, buckwheat or barley, so that the whitest flour can be manufactured therefrom.

In all departments of the exhibition there was a marked improvement on former years, and a gratifying manifestation of interest on the part of all of our citizens. The annual address by Joel B. Nott, Esq., was an able production, and was listened to with great interest.

Climatic Temperature.—It is important to the agriculturist that he notices and observes the "*climatic temperature*" of his particular location, and its adaptation to produce the different crops he is desirous to cultivate.

Particular attention has lately been given to notice the range of temperature in different parts of the world, to compare its relative adaptation to agricultural products. Between the climate of the United States, compared with that of Europe, a vast difference is found. It is here far below that of the same latitudes of the Eastern continent.

The elevation of the land above the level of the sea diminishes the temperature of the soil. The winds and rain also determine and affect the warmth of the atmosphere. Evaporation of water lowers the temperature. A wet soil is cold and unfit for vegetation.

The elevation of Seneca lake is about 450 feet, that of Crooked lake some 700 feet above the ocean, and the mean elevation of the soil of Steuben county some 300 feet above the Crooked lake, which, from observation, is found to be equal to about *three degrees* of temperature compared with that of the ocean.

Elevation of the soil above the tide water affect the development of vegetables, and at certain points they cease to grow for want of heat. In "*vertical temperature*" we notice a regular gradation from the level of the ocean to the line of perpetual frost. Many vegetables cease to grow far below that line, as, for instance, corn will not come to maturity in our latitude, at 1500 feet above tide water.

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From the above data, and the climatic effects produced by winds and rain, we may determine *our* climatic adaptation to agricultural products. Wheat will not grow in a climate that ranges above 95 degrees, but corn will sustain a temperature as high as 110 degrees, and dwindle when it falls below 65 degrees.

In Steuben county a great diversity exists in temperature—sudden elevation far above the monthly range, and depressions so low as to produce frost. These extremes give a more elastic character to our staples, and acclimate them to a greater area over which they may be produced. Our productions are, consequently, more irregular than those of more uniform climates.

As the temperature of the climate and soil always affect agricultural products, a strict observance thereof is essential to successful farming. A wet soil is always cold, drainage will raise its temperature and render it more productive. It is always important, where the range of temperature is low, to drain the soil, and thus warm it and fit it for early and successful culture.

To the farmer the peculiar characteristic of our climate and productions should be an interesting study. Our climatic range is peculiar in that it mingles the cereals and the grasses with the products of warmer climes, and the uncertainty attending their growth and perfection from year to year. This shows the necessity of defining the products that may be fully relied on in any given locality, and of observing the guides to productive capacity, as controlling the acclimation of staples, and dividing the country into sections, as favorable to certain products, and each somewhat different from the other.

Take the whole United States, and those staples which distinguish the eastern half are quite limited and irregular throughout the western.

In the State of New-York some parts rather favor the production of corn than wheat, and others grasses than cereals.

Indian Corn is produced in no particular latitude. It is grown in the valley of the Red river, upon the banks of the St. Lawrence, and throughout the southern States. No plant is so well suited to different climates. It will accommodate itself to every degree of temperature where the range is above 60 degrees.

In the United States there are places, however, where it cannot be fully developed in perfection. In Maine, New Hampshire, Vermont, and in the more elevated portions of New-York, it is an uncertain crop.

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In Steuben county the liability to frosts, and to injurious extremes of temperature *affects the certain maturity of corn*. Our highest hills scarcely permit its cultivation. The river vallies, the lower intervals, present some adaptation to its growth and perfection.

Corn requires a dry, rich, and friable soil. It will not grow to perfection upon a strong clay, nor upon poor wet land. It is a gross feeder—it extends its roots over a large space in search of food. He who would raise an abundant crop of corn must have a rich and a most thoroughly cultivated soil.

The *corn crop* in Steuben county, for the present year, has exceeded the general expectation. The spring months were cold and unpromising. The early summer weeks were wet, and until near August the indications were altogether unfavorable, but the latter summer, and early fall months aided in resuscitating, and maturing the crop to a fair average.

The observing agriculturalist will notice that the range of climate adaptation to the growth of *wheat* is greater than that for any other grain, and that *its maturity* is incidental to a defined temperature.

Wheat matures in Steuben county, the latter part of July and the first of August. In Virginia, in June. In South Carolina, in May. The more uniform and lower the climate, the longer the crop is growing to maturity. In Steuben county it requires *full eleven months*. In Virginia not more than nine. While in England it requires the whole year.

From these data it will be seen, that in northern and elevated localities, where the range of temperature is low, wheat must be sown earlier than in those more southerly and warm. He who attempts to cultivate wheat, in Steuben county, as in Maryland and Virginia, will fail, because he observes not the laws by which its production is limited. The failure of the crop is noticeable, in our county, from *late sowing*, rather than from any other cause. *The twenty days preceding the tenth of September limits the seeding period*, and every departure from it, except for special reasons, will jeopard a full crop.

I refer to these facts to show that the judicious farmer will make use of the known relations of climate to vegetable life, to determine what to attempt and what to avoid. That by observing the adaptation of soil, and climate, the farmer can avoid the losses and disappointments resulting from ignorance of the capacities, and deficiencies of his particular location.

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The wheat crop throughout Steuben county, the present year, was full in average and quality. It escaped damage from the summer rains, that almost rendered the crop worthless in earlier localities, as it became matured after the rains had ceased, and was secured in good order. The finest wheat marketed, the present autumn, was grown in Steuben county, and the yield is unprecedented in the history of our agriculture, being far greater than ever before produced.

The *Vine* will not grow to full maturity in Steuben county. Its cultivation is rendered very uncertain, probably from excess of humidity in climate, and certainly from greater extremes of temperature.

We know, that in Europe, its cultivation extends to fifty-one degrees north, and that great care has extended its cultivation quite beyond its natural limits. But in Steuben county it can scarcely be cultivated except in favored localities. With us, the mean temperature is not a responsible guide, but the humidity of the atmosphere, and distribution of rain, in connection with temperature. Not only the summer months, but the whole period of its growth, give character to the grape, and determine its value.

"The annual mean temperature of a place," says Blondeau, "is not sufficient to determine whether the vine culture will be entirely successful. It is necessary to inquire whether the circumstances do not interpose insuperable difficulties. Where the vine is exposed to cold winds and a humid atmosphere it is seriously injured in growth and products."

Bordeaux, in France, with a mean temperature of fifty-seven degrees, and Cincinnati, in Ohio, at fifty-three degrees, stand as thirty four to forty-seven in respect to rain for the year, and with less exposure to extremes during the colder seasons.

Our greater climatic range, and frequent changes to cold and wet, throw us upon the cultivation of the native vine, and confine it to the most favored localities.

Steuben county comprises a moiety of those elevated lands known as the "dairy district" of the United States. It is comprised within the range of hills and vallies from which flow the head waters of the Chesapeake and the St. Lawrence. They abound in pure water, sweet pasture, and a cool and healthy atmosphere. The grasses growing amid these hills and vallies furnish the most grateful food, and are estimated the most valuable for beef and dairy purposes.

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In our county, too little attention is bestowed upon the improvement of meadows, and pasture grounds. Our farmers do not study the nature and habits of grasses, or notice their relative merits. They do not see the importance of learning their peculiar properties, or which of them will render their lands more productive, and furnish the largest returns. Grass lands are as susceptible of improvement, as lands tilled to grain, and the observing farmer will study their appropriate culture, and the grasses best adapted therefor.

A series of experiments have been instituted in England to test the comparative value of the different grasses there cultivated. Out of the 200 varieties growing in England, and of the number produced in the United States, which afford the greatest quantity of nutritive matter during the year? and which of them are best adapted to our soil and climate? are questions the practical farmer will solve by a close observation of their habits and qualities.

In England, the "*tall fescue grass*" stands highest, and the "*Herds grass*" next. In the United States, some of our writers place the "*Tall Oat grass*" as the best for green fodder, and hay. The "*Orchard grass*" is highly estimated, and is taking the place of the "Herds grass" (Timothy,) for pasture and hay.

In our section of the State, and particularly in Steuben county, the grasses generally cultivated are, Timothy and red clover. The latter is esteemed for its ameliorating and fertilizing properties, and as valuable for alternating with grain. It is generally sown with "herds grass" for permanent laying down, but in a year or two is displaced by the white clover, blue grass, (*Poa Pratensis*) and other native varieties, that are produced spontaneously, and from which the richest sod and the sweetest pastures are produced.

There are some grasses not cultivated in Steuben county that are valuable for dairy and grazing purposes. The "*Sweet Scented Vernal grass*" is well adapted to our hills and valleys, it is valuable for early pasture, is of fine flavor, and produces the richest and sweetest milk.

The "*Red Top*," or "*Fowl-meadow grass*" is peculiarly adapted to our lower and wet meadows, and pastures; it will grow abundantly in a low, wet soil, form a compact sod, yielding sweet hay and pasture. This grass is very much adapted to our climate, and where it obtains lodgment produces abundantly.

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The "*Floating fescue grass*" is adapted to low swampy lands, where other varieties will scarcely vegetate, and with the "Meadow fox-tail grass," "Meadow soft grass," "Rye" and "Herds grass," produce good hay and pasture.

Our farmers should also notice the loss in weight of different grasses, caused by evaporation in process of curing for hay, as this will indicate their relative value. From experiments made, it has been ascertained that Clover will lose from 60 to 70 per cent; Timothy from 50 to 60; Red top from 40 to 50; Blue grass from 30 to 40.

Old pasture grounds are more highly prized in all our dairy districts, than those recently laid down; they contain a greater variety of the finer native grasses, some of which start early, others later, giving a succession of fresh feed, and of a quality more nutritious and abundant.

The grasses of Steuben county, appropriately estimated, exceed the value of any other crop produced annually within its borders. Though neglected and scarcely noticed, as a portion of our yearly products, the aggregate is far beyond that of any crop upon which we bestow particular care and attention. The yield the present year is without a parallel, and the average far beyond that of any other season.

Rye has been cultivated more generally throughout our county than in former years, and its value is becoming more fully appreciated. The yield has averaged some twenty bushels per acre, and in some districts as high as twenty-five bushels. A greater area has been sown to rye the present autumn than at any former period.

No crop cultivated in the county has produced as quick, and as valuable returns as *barley;* its yield was far above the usual average, and the market price such as far exceeded any preceding rate or sanguine anticipation. By means of the Elmira and Williamsport railroad, a new market has been opened with Philadelphia and Baltimore, and purchasers from those places have out-bid any in our own State, and secured the larger portion of the crop. This one additional avenue to market has greatly added to our prosperity, and bids fair to become the source of increased value to all our products.

The crop of oats was larger than heretofore, and the yield above the usual average. No crop of the season required more extra labor than this; the heavy rains, and unusually heavy yield prostrated the crop, so that it could not be secured, except

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by mowing, and raking, as in hay. This single crop, in bulk, filled every barn and cover, and when thrashed, every granary. The average ranges from 40 to 50 bushels per acre.

Buckwheat was largely sown the present season, and has grown, and produced under unusual favorable circumstances. Its yield is far above the figures of preceding years, and equals that of any other portion of the State. It is one of those crops that our farmers hardly estimate in the annual returns, but comes in as filling up any vacant corner of the field or granary, without particular attention or value. But it is, really, an important crop, affording nourishment as food, and profit as a staple. It is deserving of more care and attention in its cultivation, than is generally bestowed upon it.

The blight that for years destroyed the potatoe, and rendered it unfit for food, has seemingly passed away, and left the crop to its pristine condition, in growth and maturity; scarcely "a rot," is discoverable in that tuber throughout our county. It has become sound, healthy, and nutritious, so abundant as to supply all our tables for the coming year, and to leave a surplus for exchange with our fellow-citizens who have failed to produce it.

The present season has been one of unusual productiveness, in exact contrast with that of the preceding year. Our barns, and store-houses are bursting with plenty, with abundance of every description; our markets are unusually high; and if our fellow-citizens do not feel prospered, enriched, and elevated, in their several callings, it is because they do not, and will not appreciate their advantages.

We need in all our rural districts a more close observation of the adaptation of our soil and climate to agricultural pursuits; a departure from that careless mode of farming which cultivates the *cereals* upon lands peculiarly adapted to pasturage, and the producing of beef and butter when grain would be more profitable. It is the neglect of this, that leads to losses in agricultural pursuits, and to wrong conclusions as to the productive capacities of the soil.

The system of agriculture first introduced into Steuben county was both rude and improvident: it impoverished the soil, and exhausted the resources of our population. It was a system of plowing and sowing without any regard to adaptation of soil or appropriate culture. It led to a belief that our hills and valleys were barren and unproductive; to a disposition on the part of our population to seek new homes; to abandon agriculture for

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some other pursuit, in which more profit and honor were to be realised.

We need in all our agricultural districts a permanent population—men confident of their pursuits, as compatible with dignity and honor. He who degrades his own occupation in thought or opinion, is not very likely to conduct his business in such a way as to render it dignified and honorable. He will seek in other pursuits, what he deems honor and dignity. He will there fail, for the simple reason, that all of honor and dignity worth possessing, is attained by an enlightened and steady pursuit of one's own occupation—by excelling in that.

Receipts from subscriptions, and all other sources, including interest of moneys loaned,	$473 48
Money received from the State,	138 00
	$611 48

Disbursements:

Paid out for premiums,	$444 00
Expenses attending fair, &c.,	184 44
Incidental expenses,	86 57
	$615 03

G. DENNISTON, *President.*

TIOGA.

The Tioga County Agricultural Society organized under the act of April 1855, in August, and held its first annual fair in Owego, on the 17th and 18th of October. The exhibition was one creditable for a first exhibition.

On the evening of the 17th inst. the members of the Agricultural Society met at the Court House. The President, Harvey Coryell, Esq., called the meeting to order, and stated that the purpose of meeting was to discuss agricultural matters in all their ramifications. He said that he was heartily glad to see the exhibition of stock at the fair during the day, and equally well pleased to see the interest which the farmers of the county took in the proceedings. From the numbers and the intelligence present, he had the best assurance that the Tioga County Agricultural Society

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was not destined to exist only for one year, but that its influence for good would soon be felt on every farm in the county, and that every farmer would see it to be his highest interest to sustain it, not only by contributions in cash, and by forwarding to its fairs not only stock of all kinds, but produce from the farm, the garden, the needle, the loom, the anvil, and the plane. To-day we had the germ, and a healthy one too; next year we hope to have a full development of all that Tioga can do. Let us all look forward to that event, and make preparations for it.

AGRICULTURAL MATTERS AND FARMERS' PURSUITS.

Gilbert Pearsall was called for, and responded, that others might farm better than he—still, he had some ideas on farming in which he differed from others. Agricultural papers, he said, had one fault worthy of note. They told the method by which large crops might be raised, but seldom or never stated particularly what the nature of the soil might be.

The soil that he, Mr. Pearsall, cultivated was sandy. He plowed only once, and did the rest by thorough dragging and harrowing. By this means he believed the grass crop afterwards was better. For corn he plowed deep, and in the fall, and planted in drills, which he considered the best.

Heavy and light seeding was worthy of some notice. On this point his practice was to seed light, and he found his benefit in it. One bushel of wheat is sufficient for one acre. In oats, some sow three bushels to the acre—he sowed only one and a half, and had always better crops than when he exceeded the quantity. From one and a half bushels of oats in the spring, the crop looked very thin, but it produced sixty bushels to the acre, of large, good grain.

Draining was a matter of special importance, and too little attended to. Along the whole of this valley the river gravel is seldom deeper than ten or twelve feet, and if an opening be made down to this gravel, it will drain a large surface. He had tried this with success.

The wheat crop this season had been injured by the fly, but he was happy to say that the ravages of this insect were decreasing. 'Tis said this fly only remains about seven years, and we, to our sorrow, have had it about that period.

B. H. Davis said he was a farmer in a small way, and had farmed from his youth. As to draining, he would state that he had a piece of land, in summer—a swamp, in winter—a pond. He cut

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a ditch and a hole down to the gravel, and filled it with stones. Into this hole all the water in that swamp soon ran and disappeared, and it is now my best land.

For raising corn he found plaster and hen manure, in equal quantities, the very best. Soft soap, one quart to half a bushel of corn, made a decided improvement. He also applied it to apple trees, and found it of the greatest utility in freeing them from the binding of the bark.

Dr. Allen gave the reason why soft soap was useful. The fat of the soap was lost, but the alkali was the stimulating substance.

W. P. Raymond found his corn injured, and was told that ashes would benefit it; applied ashes, and found that they benefitted the crop at least twenty bushels per acre.

E. S. Sweet said that ashes, if applied too long and in too large quantities, will ultimately deaden the soil. The greatest error that farmers fell into was that they did not observe close enough nor state their experience fully enough to benefit their neighbors. Mr. Sweet especially discussed the method of cultivating fruit trees practised by himself. The best time for pruning was when the leaves were sprouting, for then the cuts healed soonest. For transplanting, the spring was altogether the best.

T. I. Chatfield wished to state something of the origin of the Society. A few men entered into the business, and aided by the village papers, in the midst of discouragements, brought it to a happy conclusion. The fruits of their labors have been seen during the day, and are now before our eyes. The meeting in the Village Hall, and the elegant exhibition there got up, came upon us quite unexpectedly.

W. Smyth was called for and made a few remarks, which the editor of the Owego Gazette gives, as follows:

"Wm. Smyth, Esq., Secretary of the Society, had had no experience in farming, but the profession had his warmest sympathies, and he had been anxious to see a society organized here, and had been surprised that it had been neglected so long. He had often attended the fairs in England, and witnessed the beneficial results of the rivalry and competition, and the interchange of sentiments, which were their legitimate fruits; and he was glad we had an organization so well started, and to which we could look with confidence for future grand results.

"In the old country, in the evening of such occasions as this, there was generally a dinner, when the farmers spoke of their experience in the different branches of agriculture. Challenges were

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also given, and wagers offered and accepted upon the best cow, horse, or farming implement, or other article, to be produced at the next annual fair—and thus there were numerous parties enlisted a year in advance, in honorable competition for the prizes, which the loser paid not to the winner, but to the funds of the society; and he thought something of the same sort would have a good tendency here.

"A great many things were wanting to perfect our organization, and the present was a good time to take the necessary steps. A building was needed in the vicinity of the fair grounds, to be used for the exhibition of household products, &c., and the ground should be duly prepared.

"We must offer inducements to all classes, including the ladies, to come up with us, by giving premiums to all departments of industry and skill; and have a riding match, too; and we should have a fair which will attract universal attention, draw thousands of people together, and result in universal good."

Mr. Sotham, of Owego, had attended many fairs in this and in the old country, but at none did he see greater spirit than in Owego to-day. The southern tier has shown this State what it could do during the fair at Elmira, and now Tioga has taken her position among the first of the counties. Societies stimulated men to greater exertions. Mr. Sotham referred to the proud triumphs which American agricultural implements had achieved in France and England, and especially instanced the reaper.

Mr. E. Lake believed that plowing in the fall enabled crops to be got in earlier. He sowed his crops thick, believing that they were not so liable to fail—always selected the best of his crop for seed. In cutting hay, he only cut what he could take proper care of. In making butter, he kept it carefully from the air. He kept his horses on an earthen floor, being convinced that standing on boards soon injured their feet. He was glad to see the spirit that prevailed, and hoped it would continue. Less attention had been paid to mechanical improvements than he thought ought to be. He hoped to see this defect removed next year.

After a few more remarks from E. S. Sweet, the meeting adjourned.

This evening's entertainment was the most useful part of the fair, and we hope that all future fairs will take example by it. Free, friendly discussion and statements of experience are of the utmost importance.

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The second day of the fair was numerously attended, and appeared to excite general interest.

The plowing match drew together nearly 3,000 people, and the performance excited universal admiration. The exhibition in the Village Hall was still more fully attended than on the first day, and still more interest was created.

In the afternoon the people assembled in the Court House, and listened to an able address from E. S. Sweet, who did ample justice to the occasion.

Receipts—From all sources,.....		$263 00
Expenditures—Premiums,.....	$176 00	
Miscellaneous, ...	69 45	
		$245 45
Balance,.....		$17 55

Officers, 1856.—Harvey Coryett, President; Louis P. Legg, V. President; Wm. Smith, Secretary; T. J. Chatfield, Treasurer.

THE CROPS OF TIOGA COUNTY, &c., FOR 1855.

To Col. B. P. JOHNSON,

Cor. Sec. of N. Y. State Ag. Society:

1st. *Of Winter Wheat*, there was but comparatively little sown. The wheat midge committed its ravages as in former years, a few fields nearly escaping, while others were nearly destroyed. In this town (Nichols) there were a few fine fields harvested. On account of the great amount of wet weather, a majority of the wheat was more or less grown: the average yield for the county was about six bushels. It is quite evident that the Mediterranean wheat escapes the fly or midge much more than other varieties. There was raised in this vicinity a considerable amount of spring wheat, that generally escaped the fly, on account of sowing about the middle of May; by sowing at that time, the wheat begins to bloom after the day of the fly. The yield for spring wheat is about twelve bushels per acre.

2d. *Rye.*—A large amount of rye was harvested, there being between two and three times as much sown as any year before, and the yield was generally good—a few fields, and large ones, much heavier than ever before. The attention of farmers in the vicinity has been directed to the raising of rye, for the last two years, instead of winter wheat, on account of the ravages of the wheat midge, the rye generally escaping The yield is about twenty bushels per acre—some fields went twenty-eight bushels.

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3d. *Barley.*—There are generally but a few acres of this grain sown, in comparison to the other kinds. The crops in this vicinity were much injured by the wheat fly or midge. A considerable of the barley in this vicinity is of the two and four rowed, sowed together, and does not get ripe together. The average yield was not more than twenty-five bushels per acre, and not near that amount by weight, generally falling short of weight from one to eight pounds per bushel—the more injured by the insect the lighter; some heads of barley contained from one to five and six eggs of the wheat fly around each grain, and consequently the grain was much shrunk. I think, if I sow this grain another year, of sending to Ontario county for seed.

4th. *Indian Corn.*—The corn crop was more injured by the great amount of wet weather than any other; on hill land a number of fields were not hoed at all; and the water, in some places on low ground, stood two and three days between the rows; there was, in all probability, more soft corn harvested than ever before. Those that tried the large yellow or white variety, such as is generally grown on the Susquehannah flats, on hill land, had a large amount of soft corn. The average yield is but little more than last year, being not more than twenty-eight bushels per acre, while a few fields yielded sixty bushels per acre. It is a well established fact that on high or late lands no corn that we have tried is as sure a crop as the red glazed small Dutton, and eight rowed Canada corn. The kinds raised along the streams is the large yellow, large white, large dent white, and a very large eight or more rowed yellow. These last varieties often yield from sixty to eighty bushels per acre, on suitable ground. There was a larger growth of stalks on dry ground than I had ever noticed before, while on hill land the stalks were the smallest I had seen.

5th. *Buckwheat.*—Of this grain there was a large amount sown, and in all probability more harvested than ever before, and of a better quality, a large majority of the grain weighing more than the standard. Buckwheat, like a number of other kinds of grain, in some localities, was much injured by the almost constant rain; in such cases a number of lots did not yield more than fifteen bushels per acre. A considerable of such was not sown till the 20th of July; the best time we find to sow, generally, is from the 9th to the 12th of July; a few farmers sow as early as the first day of July, but generally get their crops scorched by the sun. The average yield, for the county, is thirty bushels per acre; while a few farmers, on dry land, had forty-five bushels per acre; and one

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farmer, near Owego, on a diluvial formation, had a crop that went over fifty bushels to the acre.

6th. *Oats.*—The oat crop, in many fields, was very much injured by the large amount of wet weather—in such cases the yield was not more than fifteen bushels per acre, while on dry or more favorable land, the growth of straw was larger than ever before, and more crops badly lodged than before in years. The average yield is not more than thirty-five bushels per acre; a few crops went as high as sixty bushels. The crop did not generally yield as much as expected.

7th. *Beans and Peas.*—Not much raised, generally, every farmer raising a patch of each, and where not drowned out the yield was very fine.

8th. *Grass and Hay.*—In consequence of the large amount of rain, there was a great amount of pasture the season through, but the growth was so fast, often, as to make the grass not very nutritious. The yield of hay, per acre, was more than any year before in twelve, being as much as one and a half tons per acre; and a number of meadows yielded over two and a half tons per acre. A large amount of clover and timothy seed was harvested.

9th. *Potatoes.*—In consequence of the very high price of this article, in the early part of the year, a large amount was planted, and promised fair, up to the first of August, to yield much greater than any year in twelve; larger tops were never seen in this vicinity. The early part of September showed a number of fields that had began to decay; but after the middle of the month the rotting ceased, generally. The yield is not more than fifty bushels per acre, and generally very small.

10th. *Flax and Hemp.*—Not any raised; I do not think I have seen a field or patch of flax within a year. Twenty-five years ago almost every farmer raised a quantity of flax. I am not aware that hemp has ever been raised to any amount—only in gardens, where it grows large.

11th. *Millet.*—This kind of grain is not grown much in this vicinity; when raised it generally does well, and often yields forty bushels or more to the acre; the fields that I saw during the fall appeared fine. It should be sown on new land or rich old. The grain is equal, or nearly so, to corn; and the straw to good hay.

12th. *Hops.*—This article is but little cultivated in this vicinity, but will grow to great perfection.

13th. *Fruit.*—This county is progressing very much in the fruit line. The apple is our principal fruit; pears and peaches do well

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in some situations. It was formerly supposed that pears would amount to nothing in this vicinity, but there have been beautiful pears raised this season, of a number of varieties. Peaches undoubtedly will do well; as yet the varieties, generally, are small and poor. Plums formerly did well; now the trees are nearly all destroyed by the curculio. Of grafted apples in this vicinity, the principal varieties are two kinds of Juneating, Pie Apple, Chester or Pauison, two kinds of Greenings, two kinds of Spitzenburghs, two or three kinds of Seeknofurther, Wine Saps, Belleflower, Black Belleflower, Black Apple, Golden Rennet, Russet, Swaar, Blue or Fallawater, King Apple, Parker Apple, three kinds of Sweet, three kinds of Vandevere, Tallman Sweet; and within three or four years, Northern Spy, Baldwin, Wagener, and a number of other kinds have been introduced. The little old fashioned green and streaked apples are fast disappearing. The crop of apples in this county was various, some orchards full, others none.

14th. The price of grain and other kinds of produce, for the year back, 1855, has ranged very high; wheat, from $2 to $2 50, and some sold in May for $2 75; rye, $1, in winter, $1 25; oats, from 44 cents, in winter, to 62½ cents, in June; barley, $1; buckwheat, 62½ cents, in winter, to $1 25, in summer; corn, from 75 cents, in winter, to $1 25, all summer; potatoes, $1 in April, to 75 cents all summer; butter, 20 cents a pound, all summer, to 25 and 28 cents in November; cheese, from 9 to 12 cents a pound; pork, from 12 to 14 cents a pound in barrel, and in November, from 7 to 9 cents in the hog. Butter and cheese, a large amount made. All kinds of produce, in this county, find a market on the line of the New-York and Erie railroad, at the following places: Waverly, Tioga Center, Owego and Campbell; besides two or three other places on the south side of the Susquehannah river.

15th. The price of cattle, &c., has also been very high, during the year: working oxen, from $120 to $170 per yoke; cows, from $22 to $35; horses, generally, $150 per head; sheep, from $2 to $3 25, for extra; hogs, very high and scarce, worth 5 cents a pound alive, and dressed, in November, from 7½ to 9 cents a pound.

ROBERT HOWELL.

TOMPKINS.

In submitting the report of the Transactions of the Agricultural Society of Tompkins County, for the year 1855, I am not

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cheered by the prospects for the future, nor can I felicitate the Society upon its exhibition the last year. The friends of agriculture had hoped that the proximity of the State exhibition to our county would have awakened a new zeal in the cause of agriculture at our own county fair, and called out a spirited competition. In this anticipation we were disappointed, and, although on the day of our annual address a respectable audience of ladies and gentlemen assembled in the hall to listen to a very able and instructive address from the Secretary of the State Society, it was apparent that the reputation of the speaker drew the audience more than a real and hearty zeal for the cause of agriculture. In a central county of the State, with a population largely engaged in agriculture, blessed with as rich and varied a soil as can be found within the most favored portion of the State, the assessed valuation of its real and personal estate exceeding $13,000,000, a meager handful of some two hundred and fifty men, only imbued with sufficient pride and interest to subscribe their $1 a year to promote the objects of the Society, is at least a poor evidence of a healthy organization, and is an assurance of a weak vitality and speedy dissolution.

At the various business meetings of the Society for the past year no general attendance of the Executive committees could be procured; a few gentlemen worthy of mention should be named, however, as an exception to the general charge; Col. Brewer, E. L. B. Curtis, Esq., Smith Robertson, Wm. Carmun, Esq., D. Crocker, John Giles, and a few others, for their untiring labors deserve honorable mention.

It is hoped that by a more systematic organization, and by procuring a suitable lot, buildings and show ground, the Society will be more efficient in future.

At our last annual show the net receipts of the Society, by voluntary subscriptions and tickets of membership, was $137 00
Received from the State,..... 114 00

$251 00

Amount awarded for premiums,..... $164 00
Expenses of show and printing,..... 117 00

$281 00

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The Society contemplate fencing about five acres already contracted for, and erecting permanent buildings and tents for our next exhibition. It is with pleasure that we are enabled to point to the awards at the State fair, and find Tompkins county bearing away its full proportion of the first premiums at that fair. Our herds of improved stock and fine horses received a proper appreciation in the various classes in which they were exhibited.

So far as I have been enabled to gather statistics of the crops last year in this county, without any reliable data, I can only give a general estimate. The oat and corn crop has largely increased relatively over the wheat crop in this county; the ravages of the Wheat midge upon the wheat has discouraged many of our farmers from devoting so large a portion of their lands to this crop as formerly, and while a few pieces have comparatively escaped its ravages, as a general rule, oats and corn, and other summer grains, are admitted by our most intelligent farmers as the most profitable crops for cultivation in this county.

The severity of the last winter deprived us of our usual peach crop, and the low range of the thermometer the present winter create well founded fears that we are to be equally unfortunate in our hopes of this delicious fruit the present season.

The cultivation of grapes on our low lands and the rich bottoms about the Cayuga lake is receiving increased attention, and the rich production of the Isabella and Catawba are well repaying those who have limitedly embarked in their cultivation.

It is expected that the Horticultural Society will unite with the Agricultural Society of this county, and that with the united energies of the two an increased interest will be imparted to agriculture the present year.

Officers for 1856.—Col. Henry Brewer, Enfield, President; Francis M. Finch, Esq., Ithaca, Secretary; N. Crittenden, Esq., Corresponding Secretary and Treasurer.

CHARLES G. DAY, *Secretary.*

ULSTER.

The annual fair and cattle show of the Ulster county Agricultural Society, for 1855, was held at Stone Ridge, in Marbletown,

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on the 11th and 12th days of October. The weather was unfavorable, being rainy, and the attendance consequently smaller than usual. The exhibition of stock, manufactured articles, and vegetable productions was very fair.

Officers for 1856.—President, Cornelius M. Van Leuven; Vice-Presidents, William Cockburn, C. L. Kiersted, Joseph Arnold, Jacob Elting, and Peter H. Brink; Corresponding Secretary, Peter Crispell, Jr.; Recording Secretary, S. S. Hommel; Treasurer, Rodney A. Chipp; Executive Committee, James Kiersted, Kingston; John Crispell, Hurley; James Well, Saugerties; Severyn Hasbrouck, Marbletown; Philip Hornbeck, Rochester; A. B. Preston, Wawarsing; Henry Winchel, Olive; Timothy F. Tilson, Rosendale; Eliakim Sherill, Shandaken; Elliot Thompson, Esopus; Roeliff Elting, New Paltz; A. B. D. Elting, Lloyd; D. L. Bernard, Plattekill; Richard Hardenbergh, Gardiner; Nathaniel Hallock, Marlborough; Eli Van Keuren, Shawangunk; William Van Gaasbeck, Woodstock; Jacob Osterhoudt, Denning.

S. S. HOMMEL, *Rec. Sec'y.*

WASHINGTON.

The annual exhibition was very encouraging in all its departments. The show of blood horses, for which the county has long been distinguished, was in the highest degree creditable, showing some extremely fine horses. A very interesting display of working oxen was brought forward; and the competition in improved stock was very spirited.

In the implement and mechanical department, as well as in the domestic hall, the display was in every respect most creditable to the county, and evinced progress in each department.

The equestrian performance by ladies on the last day, attracted much attention. It was conducted with much care, and elicited and received the approbation of those in attendance.

The exhibition of grain at the winter meeting was excellent.

Officers for 1856.—President, Dr. James Savage, Argyle; Vice-Presidents, Henry Holmes, Greenwich; Harvey Brown, Hartford; H. M. Beckwith, Granville; Daniel Rice, Easton; Berry Long, Cambridge; Recording Secretary, R. King Crocker, North White Creek; Assistant Recording Secretary, William L. Mowry, Greenwich; Corresponding Secretary, Rev. E. H. Newton, North White Creek; Treasurer, Samuel W. Crosby, North White Creek.

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Receipts from all sources,.....	$665 25
Expenditures,.....	363 93
	$301 32

Extract from report.

O. COOKE, *Rec. Sec'y.*

WAYNE.

The county of Wayne contains 332,000 acres of land, of which about 240,000 acres are under cultivation. The high value of these lands for agricultural purposes has rendered their improvement rapid within the last few years.

The soil is various, and although generally adapted to the cultivation of the cereal products, as well as grass, almost every kind of farm produce is grown with success.

The climate is mild in comparison with other counties in the same latitude, especially that portion bordering on Lake Ontario. All kinds of fruit compatiable with this latitude are produced in abundance.

The forests, as well as cultivated lands, are becoming valuable on account of the timber, which is generally of a superior kind and quality. Several thousand acres of low land, covered with yellow cedar, and black ash timber, which have heretofore been considered nearly worthless, have advanced in price, and are now selling for from $100 to $200 per acre, and will furnish materials for fencing for many years to come.

Limestone is found in abundance in various parts of the county, and is indicative of the character of the soil, and is valuable in the great facility for the manufacture of lime and for building purposes.

Beds of marl and bog earth, which have been found by analysis to be very rich in fertilizing substances, exists in different parts of the county, and will furnish a natural and almost inexhaustible supply to the soil, of these elements, which are constantly being detracted from it by excessive cropping. The farms of Messrs. R. Ennis and A. Hale, of Lyons, contain extensive deposits of shell marl, specimens of which have been analyzed by Professor Cochran, with the following result:

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Lime,	46.45
Carbonic acid,	36.51
Silica,	5.99
Alumina and oxide of iron,	3.26
Organic matter,	6.83
Traces of magnesia and potash,	.00
Loss,	.96
	100.00

The facilities for marketing produce are ample. The Erie canal, and the N. Y. Central Railroad pass through the southern part of the county, while the northern portion is accommodated at the various ports on Lake Ontario. Sodus Bay forms the most extensive and safest harbor on the lake, and it is believed that when the inland communications already in progress, terminating at that point, shall have been completed, the commercial interests of the county will be rapidly enhanced.

Wheat has heretofore been the great staple product of the county. The ravages of the midge for several years past, and of the Hessian fly during the last year, have to some extent discouraged its cultivation. Notwithstanding the crop of the present year was unusually good, though unfortunately much of it was injured by excessive wet weather during harvest.

The corn crop, though better than that of the preceding year, falls something short of its usual average on account of the cold, wet season.

Barley and oats were never better; potatoes yielded well but were slightly affected with rot; the hay crop was more than usually heavy, but was much damaged in curing.

The peppermint plant is cultivated in this county to considerable extent, on account of its oil, of which about 10,000 pounds are annually produced, being about one third of the entire product of the United States. The crop this year has been abundant, and prices highly remunerative, but the fluctuations of the market render it a highly unstable product. Messrs. L. B. & H. G. Hotchkiss, of Lyons are the principal dealers in oil, and nearly the entire product of the Union, about 30,000 pounds passes through their hands.

The fruit crop has been generally good, especially apples, which have been produced in abundance, and of a superior quality. About 100,000 barrels have been sold and shipped chiefly to

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eastern markets. The price has been lower than usual, in consequence of which a larger amount has been fed to stock, and otherwise disposed of, making the amount shipped less than preceding years. The amount of dried fruit annually sold in this county exceeds $25,000 in value.

The extreme cold in the winter of 1854, or some other cause proved fatal to the peach crop, whereby no inconsiderable loss in luxury and profit has been sustained. Although this county is justly celebrated for the quantity and excellence of its fruit, yet the planting of orchards still continues without abatement.

Improvements of the various breeds of farm stock is a subject in which the farmers of this county begin to take a deep interest. It has been previously neglected for want of sufficient enterprise, and because the production of grain, was supposed to be more profitable. An impetus has been given to improvement in this respect which will doubtless continue until the flocks and herds of Wayne county will cease to be a reproach to the husbandman. The exhibition of horses at our annual fair showed a gratifying progress, and the Devon cattle of Messrs. Thomas & Collins will compare favorably with any of their kind in the State. Choice specimens of the best breeds of sheep and swine have been introduced, the good results of which are already manifest.

The Wayne County Agricultural Society was reorganized in May last, under the law of 1855. The farmers and mechanics of the county had long felt the necessity of more efficient action in relation to the Society, as the attendance at its fairs had been comparatively limited, its receipts small, and its usefulness comparatively restricted. The new organization, and the permanent location of the fairs at the village of Lyons, gave the Society a new impulse, and its subsequent success has been greater than its most sanguine friends had dared to hope for.

The utility or policy of instituting and maintaining agricultural societies, seems to be a self-evident truth. All other interests, whether religious, political, scientific, or monetary, have their organizations, their institutions, their press, their primary and academic systems of instruction, in furtherance of their objects and prosperity, and thus attain to a higher degree of perfection and usefulness than can be arrived at by individual exertion. Farmers, more than any other class of community, are isolated and enjoy limited advantages of communion with each other, and of comparison of their different systems of culture, and variety and quality of products, except through the medium of the agri-

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cultural press, and agricultural associations and exhibitions. These annual gatherings of farmers and mechanics not only create and strengthen the relations of friendship between the members of a common calling, but induce a spirited competition and a laudable emulation to excel each other in the different products of husbandry and manufactures.

The annual fair was held on the Society's grounds, in the village of Lyons, October 9th, 10th, and 11th. The arrangements for the exhibition had been made on a scale of liberality and magnificence seldom or never excelled by any county in the State. The Society had been organized but five months, during which time the board of managers had purchased twelve acres of land contiguous to the village; enclosed it with a substantial fence, eight feet high; erected a hall or show building, eighty by fifty-six feet, with galleries and other fixtures for the advantageous and convenient display of fruits, flowers, vegetables, domestic manufactures, fancy articles, &c., which, aside from its utility for display and protection to articles exhibited, forms a majestic and beautiful adornment to the grounds. . . . .

The grounds are bounded on two sides by the Clyde river, the bank of which is thickly covered with trees and foliage, rendering shade and water accessible and abundant.

A well graded track, forty-five feet wide, and one-third of a mile in length, for the exhibition and trial of horses, was prepared, and elicited much commendation.

The number of entries made was nearly eleven hundred, and the show in every department was creditable to the farmers and mechanics of the county.

The display of dairy products, domestic articles, paintings and artificial work, proved that the ladies contributed their part towards making the fair attractive.

The exhibition of horses was unusually large and fine. The trials of speed for trotting were witnessed by thousands of delighted visitors.

The show of cattle, though not large, was good—Messrs. J. W. Collins, of Sodus, and E. N. Thomas, of Rose, being the largest exhibitors. Rare specimens of sheep and swine were shown, though not in great numbers.

The exhibition of fruits and vegetables was such as Wayne county only can produce.

The display of agricultural implements and tools was extensive and useful.

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The attendance was large—larger than the "oldest inhabitant" had ever before seen in the village or county—the number being variously estimated at from 15,000 to 20,000. The most perfect order was maintained during the entire exhibition; not the slightest accident occurred to abate the interest or mar the enjoyment of the delighted multitude.

A very able address was delivered in Floral Hall by Col. Chas. Lee, of Penn Yan, after which the Society adjourned.

In the evening, notwithstanding the inclemency of the weather, a large agricultural soiree was held in Floral Hall. Perfect order and decorum was maintained, and a more social and convivial scene has seldom been witnessed.

The annual meeting of the Society was held at Lyons, January 2, 1856.

Officers for 1856.—President, De Witt C. Van Slyck, Lyons; Vice-President, Robert Ennis, Lyons; Secretary, Southard Lewis, Lyons; Treasurer, Wm. H. Sisson, Lyons; Directors, A. G. Percy, Newark; Stephen Hyde, Palmyra.

Receipts from all sources, ...	$4,239 18
Payments, ...	4,362 23
Balance due treasury, ...	$123 05

DE WITT C. VAN SLYCK *President.*

WESTCHESTER.

The annual exhibition in this county was an interesting one, and the efforts making for the ensuing year gives assurance that a new impulse will be given to the Society. The report from the Society has not been received.

Officers for 1856.—President, Henry Wood, Bedford; Corresponding Secretary, George C. Waring, jr., Chappequa; Recording Secretary, John Cowan, White Plains; Treasurer, J. Odle Dyckman, White Plains; and twenty-two Vice-Presidents.

WYOMING.

The Wyoming County Agricultural Society, after another year of successful effort in behalf of agriculture and mechanical improve-

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ment, terminated its own existence February 22d, 1856. At which time a new organization was effected under the old name, agreeably to the laws of the State; and measures were immediately taken to purchase ground, and erect permanent enclosures and fixtures.

Our last annual fair was held on a very rainy day, but under the circumstances, it was all that could have been expected.

Whoever doubts the favorable influence of our State and county agricultural societies, can have very little skill in tracing cause and effect. While all due respect should be shown to the *home feeling*, eminently characteristic of American citizens, it remains true, that occasional glimpses of the *great world*, are essential to progress and improvement. Agricultural and mechanical fairs have furnished the occasion and the opportunity. Wyoming, like her sister counties, exhibits in her improved agriculture, and general thrift, the benefits derived from the agencies above referred to.

The wheat crop of 1855, as is generally known, suffered much from wet weather, before and during harvest; the poor wheat regions suffering less than the best; and may be put down as generally light in this section. The low price of wool, and the high price of meat, has induced farmers to sell many of their sheep, but our county is still largely interested in wool growing. Increased attention is being paid to the raising of good horses; Morgans and Black Hawks are introduced to some extent, but there are very few if any "thorough bred" animals among us. Still we have the descendants of Messenger, Sampson, Marion, Duroc, &c.; and our horses are improving somewhat. But we need *legislative interference* (if nothing else will do it) to prevent the absurd practice of taking the best mares for work, and for market, while we *breed* from broken down and inferior nags, good for nothing else, and certainly not fit for that.

Our improved cattle are Durhams and Devons. Many of our citizens send down their own fat cattle to New-York, now the railroad communication is so direct. Whether it will *pay* to kill off the "middle men" remains to be seen. Our dairy interest is large and every way prosperous; but is guilty of a most culpable negligence, in not properly representing itself at our fairs.

Prof. Wright of Warsaw Academy, and Prof. Weed of Middleburgh Academy, dismissed their schools (both very flourishing institutions), to attend our fair, thus manifesting the respect due from science to agriculture.

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Prof. Weed gave a very excellent geological address, illustrating it by charts and specimens from his valuable library and cabinet.

Real estate has doubled in value within the last ten or twelve years, and agriculture was never more flourishing than at present in this county.

Receipts and disbursements:

Receipts,	$283 04
Payments,	36 02
In treasury,	$247 02

The Society was re-organized under the act of 1855, on 20th February; the old organization being first dissolved.

Officers for 1856.—President, Hugh T. Brooks, Pearl Creek; Vice-President, Uriah Johnson; Recording Secretary, H. A. Dudley; Corresponding Secretary, John L. Clark; Treasurer, Hon. John A. McElwaine; and nine Directors.

HUGH T. BROOKS, *President.*

YATES.

The annual fair was held at Penn Yan, on the 19th, 20th and 21st days of September. Although we suffered much inconvenience on account of the inclemency of the weather; and from the fact also, that a town Society had been recently formed, embracing two of our towns and one from Ontario, and having held their first annual fair only the day previous; yet the attendance was as numerous as could be expected. And what was particularly encouraging, was to see in attendance most if not all our farmers and artizans, who feel and see the propriety, and the great utility in sustaining and carrying forward the laudable objects and designs of the Society. From the exhibition of stock, it is quite evident that a greater interest is manifest from year to year in the improvement in the blood of the same, and although the display was not as numerous as on some former occasions, yet the show was good. The Hereford stock exhibited by John H. Lapham, and to whom was awarded large premiums at the State Fair at Elmira, are owned in this county, and were present and much admired. Inasmuch as "little Yates," stands *first* among her sister counties in proportion to her size and population in the *wool* growing world,

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there could be no such thing as fail in the display of *sheep* with us. The fame of William T. Remer and Joshua Rapalee as breeders of fine wooled sheep stand high in western New-York. The display from their flocks was large, and greatly admired; particularly those animals which received premiums at the National Wool Growers' Association.

The exhibition of Horses was unusually large, numbering something over one hundred, many of which were not only claimed by their owners to be of good blood and high pedigree, but on trial of speed shown to be "fast."

Job L. Babcock's show of Suffolk Pigs we claim cannot be excelled in the State.

Among the farm implements the great "Ontario Ditch Digger" was present, and looked upon by our farmers as opening a new era to successful agriculture in western New-York. This machine on trial proved itself an implement of great labor-saving, and well worthy the attention of agriculturists, and as such recommended to their attention. This machine performs the labor of at least ten men. It is the invention of R. C. Pratt of On tario, manufactured and for sale at Canandaigua by Pratt & Brothers, price $150.

The show of fruit and vegetables was never better in the county.

The annual address was delivered on the fair ground by the Hon: A. B. Dickinson, of Steuben, on the afternoon of the third day, to a large and attentive audience of farmers.

Yates county is particularly adapted to the growing of wheat, barley and wool, as will be seen from the census reports of 1855. We have a population of only or about 20,000 inhabitants, and with a fraction over 100,000 acres of arable lands under cultivation, and yet our annual products are as follows: wheat, 500,000 bushels; barley, 200,000 bushels; wool, 250,000 pounds.

Our farmers fortunately, perhaps providentially, for the past few years have received a severe check in their headlong race to ruin by the partial, and in some locations almost entire, failure of the wheat crop. Many have been the causes which have brought about this state of things—the Wheat midge has made great ravages, the winters have been severe, and the "thousand ills to which vegetation is heir to" have in their turn been endured and contended against. Had the truth sought in regard to this crop, and the farmer's eye been open to a realizing sense of his errors and true position, much of the loss of time, patience

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and money might have been saved. We look, therefore, upon the partial failure of this crop as a benefit in the end rather than an injury, from the fact that it has directed the minds of farmers to a more scientific and intelligent inquiry into the subject of successful farming.

The farmer who a few years ago was ploding through an "old fogy" system of depletion and impoverishment of his soil by sowing year after year the same crop upon the same field, having a particular or favorite field known as the "wheat or rye field," the "corn field," the "thistle or *bush* lot," the "wet pasture lot," &c., may now be seen pursuing a more wise and prudent course of rotation of crops and system of farming generally. In his selection of agricultural and labor-saving implements, and particularly the plow, he prefers that which will do the work the deepest and most thoroughly. His "pond holes" and wet places are now thoroughly underdrained, and by a judicious selection of summer crops, seeding often and with a liberal hand to clover, the plowing under of green crops, his success is made the more certain.

Barley, for a few years to come, should the present prices continue, will probably be the crop of the county.

"Yates County," or rather "Crooked Lake" barley commands a higher price in the barley market than that grown in any other section of the State. With a moderately enriched soil, thoroughly underdrained, with a fine tilth and plenty of good seed, Yates connty farmers are reapiug at this time, perhaps, more real cash profit than from any other crop.

Barley does better on a deep rich mold or a warm sandy loam than in any other. Early sowing, when the ground is in proper condition to receive the seed, is found to be the best, say as early as the middle of April or the first of May.

It is found here to be the best crop to seed down with, from the fact of its rapid growth and broad leaf serving as a protection or screen for the young grass from the rays of the sun, and insures its growth when it would fail if sowed with any other crop.

An increased interest by the wool growers of the county is quite manifest since the establishment in Western New-York of a Wool-Growers' Association, and it is hoped will result in an introduction of a greater variety of superior blooded stock, as for instance, the South Down, Cotswold, &c., and other varieties of sheep particularly adapted for mutton. The attention having heretofore been confined almost wholly to fine wools, which has been pro-

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nounced by the Waterloo woolen factories to be of the best grades used by them in their extensive business of cloth and shawl manufacturing.

Receipts:

Moneys received,.....		$748 34
Disbursements:		
Paid for fitting up fair grounds, 1854, ...	$435 38	
Expenses of grounds, 1855, premiums, &c., ..	353 42	
		788 76
And a balance due towards show grounds, fixtures, &c., of.....		$909 86

The Society held its annual winter meeting on the 29th December, 1855, the president, Nelson Thompson, in the chair.

The committee award to Mr. Samuel Embree, for the best acre of Indian corn, of 139 bushels of ears, the first premium.

Officers for 1856.—President, Gilbert Sherer; Vice-President, Wm. T. Remer; Treasurer, David Foster; Secretary, W. S. Judd; and nine managers.

NELSON THOMPSON, *President.*

W. STEWART JUDD, *Secretary.*

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AMERICAN INSTITUTE.

FOURTEENTH ANNUAL REPORT.

The undersigned Trustees, in compliance with the statute of May 5, 1841, present a report of the acts of the Institute for the year 1855.

The exhibition of arts and manufactures of the 27th annual fair of the American Institute, held at the Crystal Palace in the city of New-York, in October and November last, exceeded in novelty, utility and variety, any previous fair, and attracted thousands of visitors—those citizens who enjoy that extraordinary genius for originality of thinking and invention, so distinguishing this new world, availed themselves of the great space and national centrality of that beautiful edifice to come from all parts of the Union with their new and improved machinery of every description, with the implements of agriculture and the arts.

This ready response from inventors and mechanics, is a proof of the high estimation with which this time honored institution is regarded. It is by this and kindred associations that the agriculturists are to be benefitted, by labor saving implements for cultivating the soil, and preparing their products for market. Among the many articles of interest to this class of visitors, were the improved plow, mowing, reaping and thrashing machines, which, contrasted with the crude plow, hand scythe, the sickle and flail, are improvements of great benefit to the farmer.

Manufactures of cotton, wool, silk, linen and iron, were also well represented, and surpassed in style and quality any foreign articles of the kind—proving the benefit of protecting home industry, thereby encouraging the mechanic and artizan.

Notwithstanding the mighty competition of Europe in every mechanical branch, and the millions imported, the progress in arts and mechanics has been rapidly advancing under the fostering hand of government; and we rejoice in this manifestation of

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America as to her perfect ability to supply herself with all she requires in mechanics, as well as in agriculture. Previous to the tariff of 1816, we imported most of our agricultural implements, now we export them of a superior quality and at far less cost, and thus with manufactures, a yard of brown shirting cost twenty-five cents a pound, of cut nails fifteen cents, and all like articles of domestic manufacture cost the consumer in like proportion; by the improvements in machinery these articles have been reduced at least two-thirds in cost, and giving the consumer a superior manufacture.

The exhibition of machinery and tools far exceeded the most sanguine expectations of the managers, and the ample space appropriated to this department was filled with more articles of recent invention and utility than even at "the exhibition of the industry of all nations," held at the Crystal Palace—among which were steam engines of novel construction, gas apparatus for heating and illuminating, and force pumps of great variety; tools for working iron, of every description, of perfect quality and finish, also for working wood in every variety of forms. The most novel and attractive machines on exhibition were several varieties of sewing machines, and also a knitting machine, which executed with neatness, perfection and great rapidity, labor which has hitherto been only performed with untiring patience and industry by the human hand.

An important feature in this exhibition was an automatic scale for measuring grain, of great ingenuity.

As the exhibition of the New-York State Agricultural Society took place in the month of October, at Elmira, it was deemed advisable that the agricultural department of our exhibition should consist of a display of the various grains, flour and meal, the productions of the dairy, fruit, flowers and vegetables, agricultural and horticultural implements, and a poultry show. The number of entries in this department were 230.

Mechanics require further encouragement; many valuable inventions are lost to the public, as the originator has not always the means and facilities for completing his design. We would recommend establishing a repository, (in the city of New-York,) with motive power and facilities for experimenting with new inventions by which mechanics may test their improvements and perfect their designs, offering the same when completed to the public, contributing thereby to the rapid improvement going on in our country in mechanical arts and sciences.

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The American Institute was formed a little more than a quarter of a century since, and having been sustained by the hearty efforts of a few, through several years of doubt and embarrassment, we now present to you this national institution in a highly prosperous condition, with its farmers' and mechanics' clubs, and its large and valuable library. We ask but the continued sympathies and cooperation of the public that its influence may be extended throughout the length and breadth of our country.

Respectfully submitted,

ROBERT L. PELL,
D. M. REESE,
ROBERT LOVETT,
JOSEPH TORREY,
E. T. BACKHOUSE,
W. B. LEONARD,
H. MEIGS,

Trustees.

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FORMATION OF AGRICULTURAL SOCIETIES UNDER THE ACT OF 1855.

LYONS, *Feb. 9th*, 1856.

B. P. JOHNSON, Esq.,

Dear Sir: At your request I forward copies of the certificate of incorporation, constitution, general regulations, &c., of the Wayne County Agricultural Society, re-organized under the law of April 13th, 1855.

CERTIFICATE.

Certificate of incorporation of the Wayne County Agricultural Society, under and pursuant to an act of the Legislature entitled "An act to facilitate the forming of agricultural and horticultural societies," passed April 13th, 1855.

We, A. B., C. D. and E. F., (ten or more persons,) citizens of the United States, and of the State of New-York, hereby associate ourselves together for the purpose of forming a society for improvement in agriculture, horticulture and the mechanic arts, as hereinafter stated, and to be incorporated under and pursuant to the act entitled "An act to facilitate the forming of agricultural and horticultural societies," passed April 13th, 1855; and for that purpose we do certify and declare:

First. That the corporate name and title of such society shall be the Wayne County Agricultural Society.

Second. The business and objects of the said society are improvement in and encouragement to agriculture, horticulture and the mechanic arts.

Third. The property and business of the said society shall be managed by six directors, as prescribed by the said act, which six directors, together with the president, first vice-president, secretary and treasurer of the said society, shall constitute a board of managers; and A. B., C. D. and E. F., (six persons,) shall be the first directors thereof; and shall, in conjunction with the president, first vice-president, secretary and treasurer of the said society, conduct the business thereof for the first year.

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In witness whereof we have hereunto set our hands and affixed our seals, the day of , 1855.

A. B. [Seal.]
C. D. "
E. F. "

The certificate should be executed and acknowledged by the parties making it, and a copy thereof filed in the office of the Secretary of State, and in the office of the clerk of the county. The parties executing the certificate thereupon become a body corporate, and can meet for the election of officers, (other than directors,) and the transaction of business.

CONSTITUTION.

Art. 1. This Society shall be known and designated as the Wayne County Agricultural Society.

Art. 2. The officers of this Society shall consist of a President, a Vice-President, a Secretary, a Treasurer, and six directors. The President, Vice-President, Secretary and Treasurer shall be elected at the annual meeting of the Society, by the members thereof, and by ballot; a plurality of votes cast to constitute a choice; and shall hold their offices one year, and until others are chosen. Two Directors shall be elected, in like manner, at the annual meeting each year, and shall hold their offices three years. Vacancies may be filled at any meeting of the Society. The legal year of this Society shall commence on the first day of February, as shall also the official term of office.

Art. 3. The President, Vice-President, Secretary, Treasurer, and six Directors, shall compose a Board of Managers, a majority of whom shall constitute a quorum for the transaction of business, and it shall be the duty of said Board to manage the property and business of this Society, as will best promote the interests of agriculture, horticulture, the mechanic arts and household industry; and they shall hold and conduct annual fairs and exhibitions, and distribute premiums to the persons exhibiting the best and most meritorious specimens in these several departments.

Art. 4. It shall be the duty of the President to preside at all meetings of the Society and of the Board of Managers. The Vice-President shall perform the duties of the President in his absence.

Art. 5. It shall be the duty of the Secretary to make and keep a record of the proceedings of the Society, and of the Board of Managers, and to perform such other appropriate duties as may be assigned him by the Society or its Board of Managers.

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Art. 6. It shall be the duty of the Treasurer to receive all moneys and property due to the Society or donated for its benefit, and to dispose of the same only by a resolution of the Board of Managers, certified by the President, and countersigned by the Secretary. He shall keep an account of his receipts and disbursements, and report the same, with proper vouchers, to the Society, at its annual meeting, and to the Board of Managers, as often as they may require; and shall give bonds for the faithful discharge of his duty, in such surety and sums as they may deem proper.

Art. 7. The annual meeting of this Society shall be held on the first Wednesday in January, at such place as the Society may designate.

Art. 8. The Board of Managers may make such rules, regulations and by-laws as they may deem proper, consistent with this constitution and the act entitled "An act to facilitate the forming of agricultural and horticultural societies," passed April 13, 1855, under and pursuant to which this Society is organized.

Art. 9. Any person residing in the county, may become a member of this Society, for the year, by paying into the treasury the sum of one dollar; or may become a life member by paying at one time the sum of ten dollars.

Art. 10. This constitution may be altered or amended by a vote of two-thirds of all the members present at any annual meeting of the Society.

GENERAL REGULATIONS.

I. Life and annual members of the Society, and all others who shall pay *one dollar* into the treasury, will be furnished with *badges* entitling them to compete for premiums, and admission, with the bona fide members of their family, with carriages, to the show grounds and all departments of the exhibition during its continuance.

II. Stock and articles must be entered in the name of the *bona fide owners*, and grain, fruit, vegetables, dairy products, and domestic manufactures, must have been raised and made by the exhibitors thereof.

III. Animals and articles that have taken premiums at previous exhibitions, will not be allowed to compete except for a higher premium. In case they are adjudged *best*, after having received the highest premium, a certificate of the fact will be awarded. No animal or article can compete but for a single premium.

IV. Premiums will not be paid on animals or articles of inferior merit, although there may be no competition. No premium shall

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be paid on any animal or article owned by a firm unless each member of said firm is a member of the Society.

V. No person shall act as a judge for awarding premiums, for which he is in any way a competitor.

VI. Any person who shall knowingly violate the regulations of the Society, or who shall seek to obtain a premium by false pretences, or by improper interference with the judges, shall be excluded from competition.

VII. Premiums awarded and not called for at or before the annual meeting in January, will be considered as donations to the Society.

VIII. Competition, except on stock, is open to the State.

The Wayne County Agricultural Society was re-organized in May, 1855, and its success since that time, it is believed, has never been equalled by any other county society in the State. Its receipts for year ending February 1st, 1856, were $4,362 23, against $730 08 in 1854.

The above forms are not supposed to be perfect, but may be used as a guide by such societies as desire information in relation to an organization under the law of 1855.

DEWITT C. VAN SLYCK.
President Wayne Co. Agricultural Society.

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WOOL-GROWERS' ASSOCIATION OF WESTERN NEW-YORK.

The organization and transactions of the "Wool-Growers' Association of Western New-York," present an interesting feature in the agricultural history of Steuben and the adjoining counties. The Association is intended to concentrate the wool-growing interest of all this section of our country, and to be made the medium of interchange and progress for this important department of American industry.

The history of wool-growing in our country presents many interesting facts in connection with our progressive industry. We have great facilities for raising sheep, and for producing wool of every grade. Our most northern States furnish some of the best specimens, and continue to raise and improve the original imported breeds. In Vermont, flocks have reached a high standard of perfection, and have increased to a large aggregate. In Ohio their culture is extending, promising an increased interest and beneficial results; and in Wisconsin, Michigan, and other States, fine flocks accumulate upon their hills and vallies, their prairies and intervales.

In 1845, the number of sheep in the United States were estimated at 19,000,000. In 1850 the number exceeded 21,000,000.

In New-York the quantity of wool produced for the year 1850 was over 10,000,000 lbs.

In Steuben county, in 1850, the number of sheep was 156,776, and wool produced 339,593 lbs.

The Wool-Growers' Association of Western New-York was organized the 3d of February, 1855. The following officers were then chosen to preside over and to manage its operations, viz: President, William Baker, Steuben county; Vice-Presidents, Messrs. L. Bradner, Livingston county; Henry Rose, Yates county; John D. Patterson, Chautauque county; Theodore C. Peters, Genesee county; Robert L. Rose, Ontario county; H. T. Brooks, Wyoming county; R. Harmon, Monroe county; R. Burritt, Tompkins county; and A. Perrin, Allegany county; Secretary, Robert B. Wilkes, Bath; Treasurer, Hon. Reuben Robie, Bath.

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The first annual fair of the Association was held at Bath, the 29th, 30th, and 31st days of May, 1855. The exhibition was in every respect creditable and satisfactory. The sheep brought together, in grade and quality, gave evidence that great care had been bestowed in the culture and improvement of the flocks of Western New-York.

Sheep, producing the most perfect fleece, are said to have been brought from Prussian Silesia, where the finest wool and most thorough blood has been cultivated. The history of the Silesian flocks is as interesting as it is instructive to the wool growers of our own country, presenting all the features and details of his own experience in sheep husbandry. The Silesian flocks were derived from the best Spanish Merino, and, through a steady and undeviating progress of cultivation, have reached a degree of perfection unprecedented in wool-growing. All this goes to show us, that it is not so much the climate, or the soil, or the country—but that care, selection, enterprise, and perseverance, may result in high attainments, and in an elevated standard of excellence.

The attempts made in our country to raise fine wool has progressively succeeded. Our first importations were made from Spain, which secured to us a large volume and weight of wool, but which did not well compare with the Saxony in fineness and softness of staple. The advanced prices bid for extremely fine wool, some twenty-five or thirty years ago, induced our wool-growers to seek for sheep producing the finest and softest wool in Saxony and Silesia. These sheep, imported to our country, were noted for their fine, soft fleeces, delicate constitutions, and liability to disease.

The price of wool has lately declined, and with it the desire to grow the light fleeces of the finer and softer grades. With the finer and softer qualities, *quantity* enters into the calculation; and a system of rearage and culture has been introduced regarding both *quality and quantity*, elasticity and nerve: enduring and prolific qualities, through which fine, large fleeces are secured, and the flocks increase is rendered more abundant and certain. This system of sheep husbandry is producing untold advantages to the wool-grower.

The experience of all of our wool-growers has shown, that to make the fineness of wool the only object, will reduce their flocks to the low average of one pound per fleece, while the aim to produce *a rich weight* will extend it from four to six pounds. In sheep culture, one must know and determine some definite end, and not be yearly changing grade, and quality—either produce the

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fine with sufficient weight to render it profitable, or the coarse with its resulting advantages in volume and increase.

The intelligent and observing wool-grower has seen, that we *have had* sheep of every standard imaginable, from the most improved down to the most coarse and barbarous—presenting every grade of cultivation from *savage* to *civilized* life; and that, like every thing around us, sheep can be made the subject of cultivation. Their improvement, like that of every thing around us, is not the work of a year, but of years, through which the end is to be sought with a steady purpose, and untiring perseverance. Selecting for his flocks, the wool-grower should choose such only as have long, thick, fine wool—sheep of hardy, robust bodies; he must continue through years to select the very best, ultimately to secure a desirable and profitable flock. Many do not not take the trouble to make selections of the very best, and the consequence is, they become the proprietors of diseased and unprofitable flocks, of slender and delicate frames, misshapen bodies, and coarse and rough fleeces.

The wool-grower to become successful in his business must study the habits and economy of sheep, and conform, somewhat, to them in their rearage and keeping. He cannot bestow too much care upon the sheep pasture, to render it abundant and healthy. He will understand, that the better and more regularly the sheep are fed, the more uniform and healthy the wool becomes. That to realize a profit from his flocks he must have judiciously arranged sheep yards; comfortable sheds; well filled racks and feed troughs; he must keep his sheep thriving and healthy, to secure large fleeces, abundant and strong increase with satisfactory profits.

No animal requires more constant attention, and no other will more richly repay for the care bestowed. Sheep require a better quality of food, and their habits of feeding are different from other stock; they will not thrive in a close or confined enclosure, it is natural for them to move about—to shift from shelter to the open air—from hill to dale; they thrive better when allowed a wide range, and full liberty to seek the air—the shelter—the shade or sunshine at pleasure.

The wool-grower will also discriminate between the different breeds of sheep, and judge of their relative qualities and defects. He will study their peculiar habits, resulting from constitution or culture. He will test the cross breeds, and ascertain their capacity to be rendered profitable. He will solve the question as to the kind of sheep that will produce the most valuable fleece, whether the Saxony, the Silesian, the Merino, or some grade be

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tween them. He will understand particularly, that all the grades and breeds of sheep will require attentive keeping and skillful selection to bring his flocks up to a standard of profitable returns; and that the want of due care in these particulars result in ultimate loss.

The Saxony sheep produce wool of a softer grade, and finer quality than the Merino. The Silesian partakes of the qualities of the Saxony and Merino combined. In the Silesian the lightness of the fleece has been obviated by careful breeding—by selection of such sheep to breed from as are possessed of the greatest degree of perfection of form, and constitution; by judicious crosses, and selecting the most perfect of their increase, until flocks are produced distinguished for symmetry and fleece. Many of the flocks of western New-York partake of this character, and have been brought to great perfection by the same process of careful breeding and keeping.

The Leicester, Bakewell's, or Dishley's, exceed all others in their propensity to fatten; they are noted for clean heads; lively eyes; broad flat backs; round bodies; small bones, and thin pelt; they are peculiarly calculated for *a market sheep*, they produce mutton of fine grain and of superior flavor.

It is important that the wool-grower should know the cost of keeping sheep through the year, and the returns he may calculate on with some degree of certainity. Wool growing is a business involving *questions of dollars and cents; of profit or loss;* like all other employments of productive industry, no man can afford to pursue it at an annual loss.

All these questions and considerations enter largely into the discussions incident upon our annual fairs, and the experience of all is there brought together for mutual instruction and advantage.

Wool-growers from different sections of the country come together to compare flocks, to exchange ideas, and a mass of material and views are there accumulated, from which no observing mind can turn devoid of some valuable suggestion or conclusion.

At the annual exhibition, held at Bath, upwards of $500 in premiums were offered on fine wool sheep; divided into five classes.

Over three hundred sheep were entered for competition. Of these two hundred were from Steuben county, thirty-five from Yates, two from Allegany, fourteen from Livingston, forty from Ontario, four from Wyoming, two from Addison county, Vermont.

Those who entered sheep for competition from Steuben county, were William Baker, Edward Brundage, Abm. Wheeler, C. D.

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Champlin, O. Shepard and A. T. Baker, of Urbana; O. F. Marshall, G. H. Wheeler, Wm. Wheeler, Chas. Ackerson, Ephraim Aulls and Levi Gray, of Wheeler; Joshua Healy, of Dansville; H. McElwee and Jno. Richardson, of Bath.

From Yates county were Joshua Rapalye, of Barrington; Peleg Gardner and J. A. Potter, of Potter, and Wm. T. Remer, of Penn Yan.

From Ontario county were Calvin Ward, of Richmond; E. F. Leach and Thos. R. Peck, of West Bloomfield.

From Livingston county were John S. Beecher, of Livonia; Andrew Perrin, of Conesus.

From Wyoming county were John Gilmore and Nicholas Chilson, of Covington.

From Allegany, Wm. H. Greene, of Alfred.

And from Vermont, Tyler Stickney, of Shoreham, Addison co.

The reports of the awarding committees were as follows:

Class 1.

"The awarding committee for class 1, report, that they have examined all the sheep offered for competition, and are highly pleased to see so many fine specimens presented for their award. After a careful examination, the committee award the 'sweep stakes' premium to the pen, exhibited by Calvin Ward, of Richmond, Ontario county, and fully award to the other pens presented, our commendation for qualities that go to make up our first flocks.

"Some of the bucks presented for competition are worthy of more than a passing notice. We would particularly recommend to the wool-growers of our country those exhibited by Tyler Stickney, of Shoreham, Addison county, Vermont, as possessing all the qualities of desirable sheep, in fine wool, with oil enough to sustain a healthy growth, and in proportion and vigor of body.

"The committee award the following premiums on bucks:

1st premium	on the buck	exhibited by	Wm. Baker, ...	$50 00
2d	"	"	Tyler Stickney, .	40 00
3d	"	"	Joshua Healey,..	30 00
4th	"	"	Levi Gray, ...	20 00
5th	"	"	Calvin Ward, ...	10 00

WM. WHEELER,
H. HITCHCOCK,
CHAS. MORELL,
Committee.

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Class 2.

"The committee on class two, make the following awards, viz:

1st premium to	Joshua Rapalye, Yates county,	$30	00
2d "	Orlando Shepard, Urbana,	20	00
3d "	O. F. Marshall, Wheeler,	10	00

On five best two year old ewes.

1st premium to	Wiliam Baker, Urbana,	$20	00
2d "	Calvin Ward, Ontario county,	15	00
3d "	William T. Remer, Yates county,	10	00

ALEX'R ARNOLD,
W. D. DICKINSON,
N. CHILSON,
Committee.

Class 3.

"The committee on third class, fine wool ewes, report, that about seventy of this class were exhibited—most of them presenting healthy forms, with a fine silky and even staple, of a fair length and compactness. Your committee believe that such sheep carefully managed are as profitable as any others.

"The committee would call the attention of wool-growers to some objectionable features in sheep, viz: too great length of legs, narrow chests, short staple, and light in proportion to bulk of carcass—these accompany and cause weak constitutions, that can illy withstand the vicissitudes of our climate and the severity of our winters—the fineness of wool will not compensate for difference in weight.

"The committee would recommend the more compact built, but thorough bred Merino, possessing healthy forms and producing heavy fleeces.

"The committee award the following premiums:

1st premium to	Thos. R. Peck, Ontario county,	$20	00
2d "	Calvin Ward, "	15	00
3d "	G. H. Wheeler, Steuben county,	10	00

SOLÓMON HITCHCOCK,
A. PERRIN,
A. HARMON,
Committee.

Class 4.

The committee on class four, report the following awards:

1. Best two year old buck, to	Wm. T. Remer, Yates co.,	$30	00
2. " "	Tyler Stickney, Vermont,	20	00
3. " "	O. Shepard, Urbana,	10	00

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1. Best one year old buck, Wm. T. Remer, Yates co., . 20 00
2. " " E. F. Leach, Ontario county 15 00
3. " " A. Y. Baker, Urbana, ... 10 00

"The committee would also recommend those entered by A. Perrin, John Beecher, Joshua Rapalye and Thos. R. Peck, as being superior, and worthy of the attention of wool growers.

N. B. MANN,
C. D. CHAMPLIN,
C. A. W. NEWKIRK,
Committee.

Class 5.

The committee on class five award as follows, viz:
Best single ewe, to Joshua Rapalye, Yates county, ... $10 00
Best three ewes, to P. S. Myrtle, G. H. Wheeler, O. Shepard 15 00

DANIEL GRAY,
WM. A. COOK,
Committee.

All the sheep exhibited were of the finest grades and of the choicest breeds; and many that were not included among the premiums, would do credit to any flock in our country.

Mr. Wm. H. Greene, of Alford, Allegany county, exhibited two French Merino bucks, one four years old and the other a yearling, of the finest and most even fleece, and possessing all the qualities of superior breed and keeping. They were from the *Atwood stock*, which for high culture and excellence are unsurpassed in our country.

Mr. Calvin Ward, of Richmond, Ontario county, exhibited very superior sheep, as is readily perceived from the premiums awarded him. He exhibited a Silesian buck two years old, that was probably the finest wooled sheep present at the show. No one can fully appreciate the fine, soft, beautiful wool of the pure Silesian breed except from personal observation.

Mr. John Richardson, of Bath, Steuben county, exhibited fine specimens from his flock; they were as even and as clean a grade as any on the grounds, and what makes them worthy of more especial notice is the fact that Mr. Richardson has produced his flock by actual careful breeding through a series of years, improving thereon from year to year, until they can well compete with any in grade and excellence.

Among the most successful wool growers of Steuben county, and whose flocks are conceded to be superior in every respect,

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are William Baker, of Urbana; O. F. Marshall, of Wheeler; Joshua Healy, of Dansville, and E. Brundage, of Urbana.

The annual meeting of the "Wool Growers' Association" was held on the evening of the second da of the fair, for the election of officers for the ensuing year. The following officers were elected, viz: President, Hon. G. Denniston, of Prattsburgh, Steuben county; sixteen Vice-Presidents, and eight Corresponding Secretaries; Recording Secretary, Charles D. Champlin, Urbana, Steuben county; Treasurer, Hon. Reuben Robie, Bath, Steuben County.

G. DENNISTON, *President.*

SECOND ANNUAL MEETING.

The recurrence of the second annual fair of this Association suggests topics worthy of notice, and subjects for deliberation. Every gathering of our busy people, every exhibition of their products and manufactures remind us that to the *industrial classes* are committed the destinies of our country, with all her honors, distinctions, and glory—that labor with us is the great accumulator of wealth, of power, and of honor.

The whole fabric of our society, the progressive spirit of our people, breaks in upon the social and political usages of other nations. We place *labor* in the highest scale, and *indolence*, though surrounded by wealth in the lowest. Amid our busy, stirring, progressive people there can be no association with the "*idler.*" The "*Otium cum dignitate*" of the Romans is thrown out of our vocabulary, and when we speak of dignity, honor, or distinction, we associate them with industry and perseverance in some useful pursuit and occupation in life.

They who indulge in erroneous ideas upon this subject, should study and understand the genius and opinions of our people, as connected with their political economy—that they recognize *labor* as the foundation of all prosperity; that they elevate the industrial classes to the highest stations in Society; that they rely upon them more fully, and confidently, to sustain and to perfect measures of public utility.

In writing out the annual report of the transactions of the "Wool Growers Association," it will not be deemed out of place to include therein such views as may interest or instruct those engaged in any pursuit, particularly such as may aid any in their particular occupation.

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It is said in "*Cicero de Officiis*," that "they who regulate public affairs perform the greatest exploits, and such as require the highest style of mind, yet there are many of great capacities, who in private life have planned and accomplished mighty matters, and yet have confined themselves to the limits of their own affairs."

It is an undisputed fact, that the achievements of private enterprise induce and sustain that which is public; and were it not for the culture and discipline that ensures the former, we should never hear of the existence of the latter.

Prevailing opinions have misled the public mind as to the source of dignity, and of honor. It is not mainly derived from public station, or from the publicity and elevation of official duties, but rather from that which elevates and supports the nation, that adds to its prosperity and glory, —the industry, the enterprise, the improvements to be found in the private walks and pursuits of life.

Public prosperity is the result, not of war, or of plunder, but of peace, and of such peaceful pursuits as relate to agriculture, to commerce and the arts. There is a moral and a relative dignity in the labors of private life, they comprise the elements that sustain and exalt the world.

In these United States, look at the American agriculturalist, his position in society. He is the proprietor of the soil he cultivates; he is by far the largest class in the country; sustains by his intelligence and integrity the institutions under which we live. He furnishes to the other professions their brightest ornaments, and diffuses throughout society sturdy principles of truth and justice. He feeds the world by subduing the earth and by rendering it subservient to the ends of culture.

It is indeed, to the agriculturalist that we owe all that is of order and of value.

> "Ceres was she, who first our furrows plowed—
> Who gave sweet fruits, and easy food allowed.
> Ceres first tamed us with her gentle laws—
> From her kind hand the world subsistence draws."

In manufactures and the arts we notice the implements at work, and the various results produced, from the heading of a nail to the completion of the steam engine—from the manufacture of a pin to the construction of a locomotive—from the weaving of a plain sheeting to the finish of broadcloth. And as we see these operations going on, upon every river and rivulet, and in every phase, each contributing its mite to the enormous aggregate, we witness those

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departments of private enterprise and industry that honor and elevate American labor and skill, and ensures general prosperity.

Every industrial pursuit puts in requisition a mental discipline and advancement that makes us adequate to any undertaking. The examination of products of industry—the study of the operation of machinery—or seeing all the details of manufacture, make us conscious of thoughts and powers of the mind that will lead us to test our own abilities, to accomplish something of the kind.

It is said that man, as he advances in civilization, causes everything around him to participate in that advancement, and to improve, *pari passu*, with himself. Originally, everything existed in a wild uncultivated state, and as man became domesticated, he applied the process of amelioration to the vegetable and animal world, advancing them in regular gradations to the perfection in which they now exist in our midst.

It is worthy of notice, that an animal or a vegetable that has been changed from the natural to an improved state, is the best upon which to base the improving process. Culture has broken in upon its original habits, and re-applied culture will give it a tendency to make further departures from its original condition.

The laws that govern production and re-production show that the stock which is in a state of *continued amelioration*, re-produced uninterruptedly through several generations, by careful and improved culture, will continue to advance to perfection.

Van Mons defines the process, in fruit growing, to be as follows: "I have found the art to consist in regenerating, in a direct line of descent, and as rapidly as possible, *an improved variety*, taking care that there be *no interval between the generations*. To sow—to re-sow—to sow again—to sow perpetually—in short, to do nothing but sow, is the practice to be pursued, and which cannot be departed from; and, in short, this is the whole secret."

As in fruits, so in animals. Re-producing, with a view to improvement, is founded upon the established law of nature, "that like produces like," subject only to changes arising from climate, culture, and rearage.

A careful selection of the very best stock—that which is decidedly an improvement upon the parent—constitute the basis upon which to rear an improved offspring. A continued selection of the best, from which to produce, through a series of generations, will insure a continued improvement in each over that which preceded it. It must not be forgotten that every improvement requires the application of the same means to retain it that

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were made use of to produce it. If these are not strictly observed, a disposition to deteriorate may ensue, upon which may be predicated hereditary disease, and a final depreciation of the whole stock.

Questions have arisen which of the modes of producing is preferable, that of crossing, or that of propagation entirely from one kind? The discussion has developed certain facts that are of more importance to the agriculturalist than the simple question itself, as to the relative merits of the two modes spoken of. In either mode, the most essential point is a proper selection of stock from which to produce, and a continued selection of that which is an improvement upon the parent, and also an improvement upon the stock itself.

It is said that *Bakewell* formed in his own mind a standard of perfection for each kind of animals, and to this standard he gradually brought his flock. It was a continued system of improvement, brought about by a judicious and careful selection of the very best in form, physical development, and all those qualities that constituted the standard of perfection he had conceived, and to which he ultimately attained. It was the work of years, but once accomplished, he was in possession of a flock superior to any other in the country, and from which he realized immense profits.

When we speak of *crossing*, the general idea is, that we propagate from different flocks, and the results are attributed to the judicious or injudicious mode in which it is conducted.

The breeding from different flocks of the same *race* of sheep, is not crossing, in the scientific significance of the term. It is the breeding "*in and in*," as was pursued by Bakewell and others, who never brought two distinct races together from which to propagate and to improve.

In *crossing*, it should be understood and observed as a fixed law, that the product partakes of the distinctive characteristics of the *hybrid*, which is now better understood than in years gone by.

It is impossible for the *hybrid* to perpetuate its kind through a series of years; and if left to itself or its kind, it will die out. In this we may discern the causes of decay and final extinction.

The hybrid must be mated to one of the original species to produce; and when the selection is careful and judicious, the product will be an improvement upon the original.

It is said, by physiologists, that in crossing, a departure is produced from the original capacities of the parents, in the offspring, which can only be restored and improved by a continued recurrence

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to the original stock, upon the side of the male or female; and the products can alone be perfected by an uninterrupted resort to that original.

These suggestions are thrown out as worthy of the attention and most thorough observance of the wool-grower, as they refer to fixed laws of production, by which he must be governed in the rearage and improvement of his flocks.

Care should be taken in the rearage of flocks to avoid all tendencies to hereditary disease, as all tendency of the kind will preclude the idea of perfection, or even of improvement. The wool-growers of our country are not cautious enough in the observance of the health and physical development of the stock from which they rear, or we should not see so many inferior flocks throughout the country. Disease not only affects the offspring, but also the fleece, both in staple and quantity. All animals bred from an imperfect stock, will develop a peculiar susceptibility to imperfection; and, from generation to generation, more palpably show the disease in physical debility, as well as by inferior product.

It is of the utmost importance that the farmer study the habits of the different varieties of sheep, and select as the design may be, for wool, or for mutton. Sheep of large frame, wide open texture of flesh, arising from quick growth, expanding rapidly, and with a great propensity to fatten, should always be selected for mutton, as they will be fitted for the market much earlier than other breeds, and secure to the owner greater profit. Of this variety in England, the Cotswold, the Leicester, or Bakewell, the New Oxfordshire stand pre-eminent. The former are said to be "a large, hardy race of sheep, big boned, and long wooled, and peculiarly adapted for the hill ranges." Most of the flocks now are presumed to be *half Cotswold* and *half Leicester*; which cross has invariably diminished the size and detracted from the weight of the fleece. The Leicester will arrive at an earlier maturity than the Cotswold, and the cross is extended either way, as the desire may be for feeding off rapidly, or to secure an increase of carcass and fleece.

In selecting sheep adapted to a mountainous country for rearing *in low lands*, the advantages would be lost of producing a large and fine class of animals: and so on the other hand, if a breed is carried from the low lands to the mountains, the finer qualities would be lost. It is important that the breed be adapted to the district of country, and that no attempt be made to counteract those physical laws established by rearage and habit. In the mid-

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land counties of England, the South Downs are found to be adapted, as they possess an endurance of hard stocking, and of occasional short keeping, arrive at early maturity, and besides beauty and fullness of form, have a propensity to fatten.

Upon the Cheviot range of hills, on the border of England and Scotland, a race of sheep have existed from time immemorial, of great physical endurance, of full form, very active and handsome, and every way fitted to exist upon high bleak hills, where there is much cold and privation. The wool long and well fitted for combing. Upon the highest acclivities of the Cheviot hills, where pasture is scarcely discernable, are found flocks of fine appearance, yielding on an average *five pounds* of wool, and weighing alive two hundred pounds.

It is worthy of notice, that in a country like these United States, possessed of a great range of climate and diversity of soil, that sheep of different constitutions and habits are required, from those that will produce the finest staple of wool, to those that grow to a large size, and are peculiarly adapted to market. The necessities of our extended territory and population, and of our diversified manufactures require these different varieties, and each individual in his particular location, must select such as are best fitted for his particular neighborhood.

In the fine wool varieties, the "*Spanish Merino*" is undoubtedly the original of all the various grades now scattered throughout Europe and America. The *Merino* is of great antiquity, and from the earliest times has been distinguished from all other breeds. At the period of the colonization of Spain by the Romans, the breed of sheep designated in Italy as "*Turentine*," was introduced into Spain, and from that time the sheep of that country have been celebrated for the fineness of staple, to which no others could pretend. During the whole period of the Roman sway, Spain was foremost in agriculture and civilization, and through the influence of enlightened colonists, broad and permanent foundations were laid for improvements in every department of agriculture, particularly in sheep, which continued through the dark and degenerate years that succeeded the fall of the Roman Empire.

Who that is conversant with the agricultural productions of Spain, with her industrial pursuits, and the literature of her people, published in prose or poetry, and has not heard of the "flocks of the Escurial"—valuable alike for symmetry and staple. For a long series of years they were as renowned through-

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out Europe and the world as the fabled "fleece of gold," and as strictly guarded by royal edict as the choicest treasures of the kingdom.

In 1765, by royal grant from the King of Spain to the Elector of Saxony, a selection was made out of the finest of the flocks of the "Escurial," with shepherds selected to attend them; and also, in 1777, another grant was made, and selections made from the same flocks, which marked the first introduction of the Merino into Saxony.

The greatest care was taken in the keeping and rearage from these importations. They were placed under the superintendence of able and experienced shepherds; and although untoward circumstances at first intervened to discourage, yet, by perseverance, the Elector of Saxony succeeded in acclimating these flocks, and ultimately in producing an offspring yielding finer wool than that of Spain.

The superior fineness of the wools of Saxony over that of Spain, is the result of careful breeding through a series of years, in which that object was had in view, and was gradually attained by selecting from such alone as produced the finest staple.

The same careful breeding marks the history of the Silesian flocks, and the superiority of their staple over that of the original stock. All going to prove that, although different flocks may be identical in blood, yet, through different systems pursued in their breeding and management, they may be brought in the course of time to be of far different value, and to produce fleeces varying greatly in staple and quality.

Any breed of sheep, in the course of a few generations, may be made to produce either finer or coarser, longer or shorter wool, than the original stock, through the influences brought to bear upon them by food, climate, shelter, care in the selection of stock to breed from, and the care taken in their rearage, as all these combine to modify the physical development of the animal and the quality of the fleece.

As a striking illustration of this, we refer to the system of breeding introduced into France, and the appearance of the flocks consequent thereon. The French Merino is derived from the Spanish. The original importation was made in 1786, under the direction of the government. A practical school for the education of shepherds, and a government establishment for the keeping of the flocks, were instituted. The standard adopted in France for breeding, was to increase the size of the sheep and

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the weight of the fleece; and the particular mark indicating a proclivity for *such increase*, in the estimation of the shepherds, was "a looseness of skin under the throat." Selections of the kind were made, and the principle has been adhered to so strictly, in France, that sheep are now found in the flocks of that country weighing over two hundred pounds each, producing fleeces weighing from twelve to fourteen pounds—sheep with "dewlaps almost down to the knees, and folds of skin on the neck like frills, nearly covering the head."

With the American agriculturist, the question of prime importance seems to be, What variety will yield the greatest income? This being ascertained, to select and to breed with a view to that result.

Any person, by strictly observing the laws of production, and having fixed upon the particular standard to which he intends his flocks shall attain, may, in process of time, bring them up to it in weight and quality.

Aside from the principles above referred to, the wool-grower must observe his particular location, as to its climate, as to its population, as either will effect the question of economy, and of profit. Wool-growing will not give employment to a dense population; nor can it be produced as cheaply upon high priced lands as upon those of less value.

The American agriculturalist is more happily surrounded by advantages than any of the other countries of the world. The United States stretches from zone to zone, and from ocean to ocean. Its soil is adapted to the production of every variety incident to the temperate regions of the earth. There is scarcely a portion of our territory but gives employment to every department of industry. There is scattered over the land an abundance of gold, and silver, of iron, and copper, and lead, and every other metal necessary for the use of man. We have, throughout our whole territory, all the elements of natural and physical, of political and mental, power; and although we may not see, or realize but a small part of the immense aggregate, yet it is instructive at times to contemplate it.

No man can have in view the products of our mountains and plains, of our forests and clearings—can contemplate the varied pursuits, and interests of our population—can witness our American genius extending itself over sea and land, creating energies, that exert an influence throughout the world, but must

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feel expanded and elevated in mind. Judging of the past, from the present, he must be lost in the conception of the greatness, the prosperity, and the happiness, which under a benign providence, awaits our common country.

The wool-growing interests of the United States comprises an aggregate, that is, seemingly great, when viewed by itself. The flocks reach in the aggregate to twenty-five millions, and the yearly fleece to sixty millions pounds of wool, valued at twenty millions of dollars; but this is a single item of the industrial products of the country, and is a small rill, that flows to the mighty river of American enterprise, that swells and enlarges as each department of industry contributes and adds to the increasing flood.

The agricultural interest of the country occupies over *three hundred millions of acres of land*, valued at *forty hundred millions of dollars;* add to this the value of stock and implements, and we have a total of agricultural capital far beyond our powers to comprehend; and yet, all this is but an item of the industrial wealth of our country.

In our manufactures, there is an annual expenditure, added to the capital employed, of *fifteen hundred millions of dollars*, employing *one million and a quarter* of our population. Adding *three-quarters* to the value of the articles manufactured, thereby increasing the aggregate of general wealth and prosperity.

Add to this our commercial capital, and profits; interchange of products with every portion of the globe; the rich returns; the resulting enterprise; and who, in our midst, can write up, or explain, the enormous aggregate?

To the wool-grower; the farmer; the manufacturer; the mechanic; and the merchant; to every citizen of our extended country, these subjects are of great importance. They are suggested with a view to incite thought and investigation.

G. DENNISTON, *President.*

SECOND ANNUAL FAIR AND EXHIBITION OF SHEEP.

The annual fair took place at Penn-Yan, May 27, 28 and 29, 1856. It was, in every respect, creditable alike to the association, to the committee of arrangements and to the exhibitors. The sheep entered were of the finest grades in staple and sym

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metry, forming, probably, the best collection that was ever brought together in the State.

Wool-growers were in attendance from all parts of the State, and neighboring States, comparing views and exchanging ideas in respect to their particular business. Wool buyers and manufacturers from different States were present, to note the improvements attained in staple and quantity, as well as to advise with the producer as to their mutual and relative interests.

This association of the business men of the country promises well as to the future, in the more frequent interchange of sentiment; the more thorough investigation of mutual interests, and the more certain attainment of results calculated to benefit and to advance the interests of all.

Entries of Spanish Merinos—forty-eight bucks, one hundred and fifty ewes. French Merinos—three bucks. Silesian Merinos—one buck. Middle wooled sheep—eight bucks, fifteen ewes. Long wooled—eighteen bucks, seventy ewes.

The awarding committees made the following reports:

Sweepstakes—Class 1.

The committee on sweepstakes, class No. 1, report: that owing to the great difficulty in deciding as between so great a number and such excellent stock, they have deemed it proper to establish some clear and well defined rules, by which to be guided in their decision.

First. Quality, quantity, and set of wool.

Second. Sufficient oil to cover and protect the wool from "dead ends," (the result of exposure to storms,) and to give it elasticity.

Third. Form and constitutional development of the animal.

Being governed by the above rules, and by the certificates of the competitors as to keeping, rearage, &c., the committee award as follows:

1st premium to Abel J. Wooster, of West Cornwall, Addison Co. Vt.

2d premium to Orlando Shepard, of Urbana; Steuben Co., N. Y.

3d premium to H. W. Walker, of Shoreham, Addison Co., Vt.

While deciding definitely, the committee deem the whole stock entered for competition as worthy of commendation. Among which is a yearling buck, exhibited by David Cutting; also one exhibited by Elisha Rich; another by E. D. Bush; and one by Julius Stickney; all from Vermont, two by J. Haswell, of Rens-

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selaer Co., N. Y. All of which, in wool, form and appearance, show great skill and taste in rearage.

C. A. W. NEWKIRK,
G. H. WHEELER,
DAN'L W. EASTMAN,
Committee.

Sweepstakes—Class 2.

The committee have examined the sheep in this class, and regret that there was not at least one more premium to award, there being four entries and but two premiums. All of the sheep, in the opinion of the committee, are of a superior grade.

In view of the evenness of the fleece, we award
The first premium to David Cutting of Shoreham, Addison Co., Vt.
The second premium to E. D. Bush of Shoreham, Addison county, Vt.

WM. A. COOK,
E. E. BROWN,
Committee.

The undersigned being unable to agree with the majority of said committee, submits the following report:

He agrees with the majority that upon the closest examination of the five pens of sheep competing for premiums, in said class, that they are all superior sheep, and show careful breeding, having evenness and compactness of fleece, and good length of staple, and in form, are free from serious defects—and the undersigned very much regrets that the committee were compelled to pass by those that were equally deserving awards. The undersigned agrees with the majority, that David Cutting of Shoreham, Addison county, Vt., is entitled to the first premium, and dissents from the award of the second premium, not because the sheep of E. D. Bush are unworthy, but because he considers the sheep entered by Tyler Stickney of Shoreham, Vt., superior in some respects, particularly in symmetry of form, hardiness of constitution, and weight of fleece—and he thinks that the second premium should have been awarded accordingly

DANIEL GRAY.

SPANISH MERINO—*Class* 1.

The committee appointed to examine the entries in the first class of Spanish Merinos, have examined all the various lots offered, and have agreed upon the following awards:

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The first premium to Curtis Powell of York, Livingston county, N. Y., for the best buck three years old and upwards.

The second premium to Reed Burritt of Hector, Schuyler county, New-York, for the second best buck three years old and upwards.

The third premium to J. Healy of Dansville, Steuben co., New-York, for the third best buck.

The first premium to Julius Stickney of Shoreham, Addison county, Vermont, for best five ewes with lambs.

The second premium to Wm. & A. Y. Baker of Urbana, Steuben county, New-York, for second best five ewes with lambs.

The third premium to Orlando Shepard of Urbana, Steuben county, New York, for third best five ewes with lambs.

Class 2.

The committee on the second class Spanish Merino, after an examination of the various entries, have agreed upon the following awards:

The first premium to E. D. Bush of Shoreham, Addison county, Vermont, for the best buck two years old.

The second premium to Julius Stickney of Shoreham, Addison county, Vermont, for the second best buck two years old.

The third premium to J. Haswell of Hoosick, Rensselaer county, New-York, for the third best buck two years old.

Class 3.

The committee on the third class of Spanish Merino sheep, have examined all the entries, and award the following premiums:

1st premium to Julius Stickney, for pen of five ewes two years old.

2d premium to David Cutting, for pen of five ewes two years old.

3d premium to Joseph Haswell, for pen of five ewes two years old.

Class 4.—*One year old bucks.*

1st premium to G. H. Wheeler of Wheeler, Steuben county, New-York.

2d premium to David Cutting, Shoreham, Addison county, Vt.

3d premium to Julius Stickney, Shoreham, Addison county, Vt.

Class 5.—*Best five ewes one year old.*

1st premium to David Cutting of Shoreham, Addison county, Vt.

2d premium to Tyler Stickney of Shoreham, Addison county, Vt.

3d premium to E. D. Bush of Shoreham, Addison county, Vt.

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SAXONY AND SILESIAN SHEEP.

The committee on Saxony and Silesian sheep have examined this department of the exhibition. They regret to find but a single entry of this variety, and that one in age and condition so as not to entitle it to a first premium. Being entered in Class 1, No. 1, the committee, on account of the fineness of the wool, award to it a second premium of seven dollars.

FRENCH MERINO.

The committee appointed to examine this variety of sheep on exhibition, report:

That upon an examination of all the entries for competition in the first and second classes, we award to Reed Burritt, of Hector, Schuyler county, the first premium for the best buck of two years old and upwards.

To S. S. Sheldon, of Sweden, in the county of Monroe, the second premium for the second best buck.

The committee deem the above bucks very good samples of this variety of sheep, and after examining the yearling buck, being the only one exhibited in the second class, entered by O. Howland, of Auburn, Cayuga county, we deem him quite inferior, and recommend that he receives no premium above the third, and leave that to the discretion of the Executive committee.

MIDDLE-WOOL SHEEP.

The committee appointed to make awards on Middle-wool sheep have examined the lots offered for competition, and report:

Sweepstakes.

This prize is awarded to the three year old buck entered by E. M. Bradley, of East Bloomfield, Ontario county, New-York

Class 1.

1st prize to the one year old buck entered by E. M. Bradley.
2d prize to the one year old buck entered by O. Howland, Auburn.
3d prize to the one year old buck entered by E. M. Bradley.

Class 2.

1st prize to the two year old buck entered by E. M. Bradley.
2d prize to the two year old buck entered by James Harris.

Class 3.

1st prize to five ewes, two years old, entered by E. M. Bradley.
2d prize to five ewes, two years old, entered by E. M. Bradley.
1st prize to five ewes, one year old, entered by E. M. Bradley.

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LONG-WOOL SHEEP.

The committee on Long-wool sheep award the following premiums:

Sweepstakes

Premium to George Miller, of Markham, Canada West, on a three year old buck.

Class 2.—Bucks three years old.

1st premium to George Miller, Cotswold buck No. 2.
2d premium to Walter Akenhead, Leicester buck No. 7.
3d premium to Darwin Peck, Leicester buck No. 25.

Bucks two years old.

1st premium to Darwin Peck, Leicester buck No. 26.
2d premium to Darwin Peck, Leicester buck No. 27.
3d premium to John H. Lapham, Leicester buck No. 19.

Class 1.—Buck Lambs one year old.

1st premium to L. S. Munsay, lamb No. 18.
2d premium to George Miller, lamb No. 3.
3d premium to George Miller, lamb No. 4.

Class 3.—Five Ewes three years old.

1st premium to Darwin Peck, five ewes, No. 28.
2d premium to William B. Pratt, five ewes, No. 8.
3d premium to John H. Lapham, five ewes, No. 22.

Five Ewes, one year old.

1st premium to George Miller, five ewes, No. 6.
2d premium to William B. Pratt, five ewes, No. 9.
3d premium to John H. Lapham, five ewes, No. 21.

The committee regret that they had not more extended powers, as there was not a single sheep in the class denominated "Long Wool" but what, from their breeding and condition, was worthy of the highest commendation and a liberal premium.

We desire to speak of the sheep exhibited by Mr. George Miller, of Canada; they are considered in all their points above our expectations, and beyond our previous knowledge of Long-wool sheep.

The yearling buck belonging to Mr. Munsay seems the perfection of high breeding and judicious feeding. Mr. Pratt's flocks do him great credit; in fact, so slight was the difference between the flocks of ewes exhibited that it was quite difficult coming to a decision.

Messrs. Peck and Lapham are doing themselves credit by the beauty and perfection of their flocks exhibited. We speak the sentiments of very many who have visited the show when we say,

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that we are glad we have the evidence that, as the vegetable, so the animal world can, by the application of science, be molded to the taste; and, what seems to the minds of some of still more importance, we say most decidedly of high breeding and good keeping, *that it will pay.*

After the reports of the awarding committees had been read, B. P. JOHNSON Esq., of Albany, Secretary of the New-York State Ag. Soc., delivered the annual address, which was listened to with marked attention and interest. By request of the association a copy was desired for publication.

In the evening of the last day, the "*Wool-Growers' Annual Festival*" came off, where old and young, farmer, manufacturer and merchant, male and female, all classes and professions joined, in honor of the occasion, and through the festive scenes added to the general enjoyment, and promoted that social good will incident to such associations.

Officers of the Association for the years 1856 *and* 1857.—President, G. Denniston, Prattsburgh, Steuben county: fifteen Vice-Presidents; seven Corresponding Secretaries; Treasurer, William T. Remer, Penn Yan, Yates county; Recording Secretary, Charles D. Champlin, Urbana, Steuben county.

PREMIUMS AWARDED ON SHEARING.

			Lbs.		Lbs.	
Julius Stickney,	on 2 year old buck,	weight	105,	fleece	14½	$10
David Cutting,	on 1 " " "		90,	"	14.11	8
Julius Stickney,	on 1 " " "		81,	"	12	6
Elisha Rich,	on 1 " " "		90,	"	13.1	4

ON EWES.

David Cutting,	on 1 year old ewe,	weight	58,	fleece	11⅝	$10
Julius Stickney,	" 1 " " "		52,	"	10¾	8
J. C. Taft,	" 1 " " "		68,	"	12⅞	6
O. Shepard,	" 1 " " "		55,	"	9⅞	4

G. DENNISTON, *President.*

To B. P. JOHNSON,
Sec'y of State Ag. Soc.

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NEW-YORK STATE AGRICULTURAL SOCIETY.

TREASURER'S REPORT.

RECEIPTS.

Receipts from all sources,	$17,045 55
Expenses,	14,301 86
Balance	$2,743 69
Premium medals on hand,	50 00
Premium books,	175 00
	$2,968 69

EXPENSES.

By paying Dr. Fitch, entomological survey,	$1,300 00
" expenses winter meeting, 1855,	140 25
" printing and advertising,	388 43
" museum expenses,	43 26
" postage account,	195 52
" library account,	145 43
" incidental and miscellaneous expenses,	1,210 95
" expenses on account of fair in New-York,	265 50
" premiums paid on account of fair in New-York,	319 00
" premiums paid on account of winter meeting,	819 50
" salary accounts, traveling expenses,	2,514 17
" premiums paid on account of fair at Elmira,	4,488 87
" expenses of fair at Elmira,	1,032 23
" superintendents at "	323 75
" clerks business and treasurer's offices,	450 00
" police and gate tenders,	165 00
" refreshments for judges, &c.,	500 00
	$14,301 86

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We certify that we have carefully examined and compared the above account, with the vouchers accompanying the same, and that the same is in all respects just and true.

S. CHEEVER, PRESIDENT.
B. P. JOHNSON, SECRETARY.

Feb. 12*th*, 1856.

Vouchers.

A.—By paying Doct. Fitch,.....	$1,300 00
B.—Expenses of winter meeting,.....	140 25
C.—Printing and advertising,.....	388 43
D.—Museum expenses, ...	43 26
E.—Postage account,.....	195 52
F.—Library account,.....	145 43
G.—Incidental and miscellaneous expenses, ...	1,210 95
H.—Expenses on account of fair in New-York, ...	265 50

I.—PREMIUMS PAID NEW-YORK FAIR, 1844.

No. 29.	D. Boll, roses,.....	$13 00
27.	J. Broat, cheese,.....	5 00
21.	Wm. A. Burgess, dahlias,.....	10 00
17.	E. W. Badger & Co., portable saw mill,.....	10 00
15.	James Bathgate, mare and colt,.....	5 00
13.	D. A. Bulkeley, potatoes,.....	1 00
12.	D. A. Bulkeley, squashes,.....	2 00
2.	S. and D. Bonfoy, cheese,.....	35 00
9.	Daniel S. Curtis, sheep,.....	5 00
18.	A. P. Cummings, house plants,.....	10 00
28.	Joseph Daniels, linen goods, ...	9 00
8.	H. G. Dickinson, fruit, 52, 3, 4,.....	12 00
4.	Edward G. Faile, poultry,.....	3 00
19.	Hovey & Co., fruit,.....	25 00
22.	John Heartt, flowers,.....	19 00
1.	Wm. Landon, horses,.....	20 00
3.	L. G. Morris, poultry,.....	8 00
11.	Morris & Bailey, stock, ...	19 00
23.	Jas. R. Noble & Co., horse, ...	15 00
26.	J. Rice, cheese,.....	10 00
24.	A. Rider, cheese,.....	10 00
7.	Levi Shaw, needle work,.....	5 00
25.	Simeon Snell, cheese,.....	20 00
10.	David Sanderson, horses, ...	15 00
16.	R. H. Van Rensselaer, poultry,.....	3 00

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No. 6.	A. Van Bergen, calf,	$3 00
5.	Mrs. R. Wilson, stockings,	2 00
20.	Wm. C. Young, cheese,	15 00
30.	Mason Salisbury, steer,	10 00
		$319 00

(J.)—PREMIUMS—WINTER MEETING, FEB. 1855.

No. 1.	Noah Hitchcock, Jr., butter,	$15 00
2.	J. Lee, fat ox,	25 00
3.	Jacob Walley, grain,	4 00
4.	Snowden & Charles, fat beef,	21 00
5.	George Schwarz, dressed swine,	5 00
6.	Thomas Kimber, fat cattle,	65 00
7.	Dow Van Vechten, timothy and clover seed,	10 00
8.	E. H. Ireland, corn,	2 00
9.	Wm. Davison, grain,	9 00
10.	Wm. F. Baker, fat cattle,	23 00
11.	N. Gallup, fat cattle,	35 00
12.	E. W. Cady, sheep,	8 00
13.	O. Howland, grain, &c.,	29 00
14.	E. Gazeley, sheep,	15 00
15.	P. Crispell, Jr., potatoes,	8 00
16.	P. Crispell, Jr., oats,	3 00
17.	Henry Schoonmaker, oats,	3 00
18.	A. E. Van Allen, rye,	3 00
19.	D. A. Bulkeley, potatoes,	8 00
20.	Sandford Cook, fat sheep,	5 00
21.	John H. Zimmerman, wheat and grass seed,	7 00
22.	Jerome Ives, cheese,	15 00
23.	W. Ives, apples,	1 00
24.	Amos C. Wright, sheep,	10 00
25.	David Coonradt, grain and seeds,	25 00
26.	Earl & Salisbury, fat cattle,	25 00
27.	Levi Johnson, fat cattle,	15 00
28.	J. H. Gardiner, dressed swine,	8 00
30.	Hiram Converse, rye,	15 00
31.	E. Chesebro, broom corn,	5 00
32.	E. M. Bradley, oats,	25 00
33.	E. S. Hayward, fruit,	6 00
34.	Volney Burgess, corn,	5 00
35.	E. F. Carter, cheese,	10 00

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No. 36. Jonas Lasher, butter,	$10 00
37. Geo. Waterman, lettering medals,	46 50
38. A. Fitch, fat heifer,	10 00
39. Geo. W. Coffin, farm,	30 00
40. Wm. P. Ottley, farm,	50 00
41. Wm. P. Ottley, draining,	15 00
42. Jarvis M. Skinner, wheat,	15 00
43. E. S. Hayward, grain,	15 00
44. Joseph Daniels, butter,	5 00
45. W. C. Watson, prize essay,	100 00
46. Mulford, Wendell & Co., premium plate,	25 00
47. E. S. Hayward, fruit,	25 00
48. Chas. Clow & Co., implements,	5 00
	$819 50

SALARY ACCOUNT.

Vouchers- One to thirty-one,	$2,514 72

(L.)—PREMIUMS.

Mrs. B. G. Andrews, needle work,	$3 00
B. H. Andrews, cattle,	30 00
J. H. Albright, sheep and domestic manufactures,	23 00
Lettering Medals,	37 50
Mrs. Daniel Bennett, woolen blankets,	6 00
Mrs. S. A. Bunce, quilt,	6 00
Theodore Backus, vegetables,	8 00
Uri Balcom, cattle, seeds, and vegetables,	35 00
Elijah S. Buck, cattle,	30 00
Mary A. Brown, needle work,	2 00
Stephen T. Brown, mare,	15 00
Sylvanus Burtis, cattle,	23 00
Otis Bort, horse,	10 00
Mrs. H. Barney, rag carpet, &c.,	9 00
George R. Burritt and Reed Burritt, sheep,	79 00
Sylvanus Burtis, apples,	15 00
E. G. Billington, rabbits,	3 00
Miss Mary C. Billings, needle work,	4 00
E. C. Bliss, cattle, swine, &c.,	44 00
M. E. Baldwin, Lettuce,	3 00
Mrs. Beatty, needle work,	3 00
E. Bechtol, geese,	3 00

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John Brand, vegetables,	$4 00
D. Christopher, horses,	25 00
D. H. Colly, cattle,	45 00
C. F. Crossman, vegetables,	22 00
A. B. Conger, cattle,	55 00
C. F. Crossman, vegetables,	2 00
N. Culver, vegetables,	31 00
E. G. Cork, stock,	38 00
S. P. Chapman, cattle,	88 00
Jesse Carpenter, butter,	5 00
R. T. Carpenter, butter and vegetables,	35 00
B. S. Carpenter, butter and swine,	35 00
S. M Cox, cheese,	15 00
Wm. A. Cook, stallion,	20 00
N. Coryell, mare,	5 00
E. G. Cork, turnips,	2 00
S. B. Cole, colt,	5 00
Wm. Chamberlain, sheep,	124 00
Miss Julia Covell, cape,	2 00
Mrs. Daniel S. Carr, scarf,	3 00
Colden Bro's, poultry,	7 00
J. H. Coleman, cattle,	20 00
Miss Helen A. Cox, butter,	5 50
Miss H. E. Carpenter, butter,	8 00
J. B. Clark, cattle,	35 00
Mrs. Myron Cole, needle work,	3 00
N. Culver, melons,	10 00
Chautauque Company, cultivator,	5 00
S. P. Chapman, stock, swine,	5 00
Robert Covett, Jr., grapes,	2 00
Mrs. S. J. Cooley, needle work,	1 00
Chas. Clow & Co., implements,	9 00
S. P. Chapman, swine,	8 00
David Dunn, horse,	10 00
A. B. Daniel, swine,	5 00
N. M. Dart, cattle and sheep,	38 00
Miss A. Dixon, needle work,	2 00
G. Denniston, cheese,	10 00
Charles Dense, linen diaper,	4 00
Miss Ruth L. Dense, tow cloth,	3 00
Elisha Dorr, fruit,	15 00
John B. Dixon, drain tile,	5 00

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Mrs. A. S. Diven, grapes,	$5 00
Joshua F. Davis, foreign horses,	15 00
Charles Evans, rag carpet.	6 00
E. D. Ensign, coverlet,	4 00
Ellwell and Rathbone, harness,	5 00
Evans, Mrs. Charles, yarn,	1 00
T. P. Ely, gelding,	3 00
E. Eldridge, horses,	10 00
Mrs. Anson C. Ely, floral design,	5 00
Ellwanger & Barry, flowers and fruit,	103 00
F. S. Foster, jacks,	10 00
Jehiel Freeman, cattle,	26 00
A. Frost & Co., fruit and flowers,	61 00
E. G. Faile, cattle,	93 00
Fisk & Little, premium expenses,	86 83
M. H. Ferris, agent, butter tubs,	2 00
Adam Ferguson, bull,	15 00
Isaac Frink, corn, (1853,)	2 00
Eliza Foulk, embroidery,	2 00
D. K. Fitch, working oxen,	75 00
J. Frazer, pansies,	3 00
E. C. Frost, flowers and fruit,	24 00
Thomas Gould, stallion and bulls,	20 00
D. M. Grant, horses,	10 00
H. C. Green, poultry,	3 00
Miss C. Gleason, paintings, &c.,	9 00
Mrs. M. L. Gibson, ottoman cover,	1 00
C. Galatian, shell work,	3 00
R. D. Granger, corn and cob mill,	5 00
Gould, Henion & Co., manure and hay forks,	6 00
Emeline Gleason, wax flowers,	4 00
Isaac Greenwood, spading,	10 00
D. M. Grant, horses,	5 00
Hattie Grover, crayon painting,	2 00
Joseph Haswell, sheep,	59 00
O. Howland, cattle, sheep, &c.,	140 00
J. M. Hartshorn, horses,	8 00
C. Hyatt, sheep,	18 00
C. Hyatt, oxen,	5 00
Miss S. H. Hart, needle work and painting,	6 00
Geo. A. Hayborn, bouquets,	6 00
Mary J. Houston, needlework,	1 00

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D. C. Hillman, apples,..... $10 00
Miss M. Holbert, butter,..... 6 00
C. M. Hovey & Co., fruit,..... 30 00
Henry Holmes, cheese,..... 2 00
J. S. Holbert, horse, dairy, &c., ... 28 00
E. L. Hagar, harrows, ... 8 00
Frank Hall, flowers,..... 5 00
Mrs. F. J. Hicks, domestic goods,..... 11 00
Geo. Hartshorn, sheep,..... 10 00
J. Hildreth, apples,..... 18 00
Adams, Henry, bead work,..... 1 00
Hungerford, Brodie & Conover, cattle, sheep and swine,. 201 00
G. W. Hoffman, clover seed,..... 2 00
Wm. Hoffman, Jr., saddle,..... 5 00
Mrs. E. P. Heart, papier mache, ... 3 00
E. D. Hallock, saw mill, ... 10 00
George Juliand, oxen,..... 35 00
Edward Jones, stallion, ... 10 00
Allen Jeffrey, sheep,..... 8 00
Miss A. T. Jeffrey, wax flowers,..... 1 00
B. P. Johnson, premium expenses,..... 7 50
Geo. W. Jones, vegetables,..... 2 00
Moses Kinney, cheese,..... 20 00
Wm. Kimball, apples,..... 10 00
King and Carpenter, grain cradles,..... 2 00
Wm. Kinne, apples, ... 3 00
Kingwell, J. M., grapes, ... 3 00
J. H. Lapham, cattle,..... 30 00
Martin Lowman, cattle, ... 15 00
Joseph Lyons, horses,..... 15 00
Sarah Love, bouquets, ... 4 00
S. Leverich, steers, ... 12 00
John H. Lapham, sheep,..... 5 00
Stephen Leggett, steers,..... 8 00
Charles Leggett, mare, ... 10 00
Robert Lovett, premium medals,..... 87 75
Robert Lovett, premium medals,..... 37 12
John G. Lace, wagon,..... 5 00
Robert Lovett, premium medals,..... 59 10
Miss B. Lundrum, bonnets, ... 3 00
Chas. Morrell, sheep, ... 42 00
E. L. Moore, embroidery, ... 3 00

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Jno. A. McWilliams, poultry,	$3 00
Garret S. Montfort, stallion,	5 00
J. B. Mallett, apples,	2 00
O. F. Marshall, wheat,	5 00
T. C. Maxwell & Bros., pears,	5 00
Gibson, Malona, boar,	10 00
G. W. Miller, vegetables,	7 00
S. Minier, gelding,	8 00
C. N. Merriman, apples,	5 00
James M. Mattison, fruit,	10 00
Miss Arabella Mills, needle work,	2 00
Henry Martin, timothy seed,	3 00
Alexander Murray, vegetables,	2 00
John McDonough, spading,	5 00
Miss Emily Newcomb, flowers,	9 00
N. H. Northrup, horses,	15 00
George W. Ostrander, stock,	25 00
Mrs. Wm. Ottley, domestic manufactures, &c.,	19 00
Enoch Ottley, cattle,	45 00
Wm. P. Ottley, plowing, grain,	34 00
Wm. B. Oakley, bull,	5 00
E. W. Phelps, honey,	5 00
Mrs. H. M. Partridge, needle work,	1 00
Charles Peck, stallion,	15 00
G. H. Post, painting,	5 00
G. F. Potter, poultry,	2 00
J. S. & M. Peckham, cultivator teeth,	5 00
James Powers, pears,	1 00
M. C. Remington, cattle,	78 00
Martin Roberts, steers,	11 00
Robert Robson, Jr., plowing,	8 00
Wm. Reynolds, fanning mill,	5 00
M. C. Remington, breeder prize bull,	5 00
M. C. Remington, bull calf,	3 00
Francis Sinnett, painting,	4 00
Wm. H. Sotham, cattle,	90 00
W. H. Sotham, plowing and vegetables,	14 00
J. M. Sherwood, cattle, swine,	46 00
Mrs. J. Sherman, needlework,	4 00
Mrs. J. Sherman, paintings,	3 00
Milton Slauson, butter,	15 00
Lucy A. Stone, needle work,	6 00

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Lafayette Smith, cow,	$5 00
J. W. Spoor, horse,	3 00
L. S. Sprague, horses,	15 00
Alanson Sherman, stallion,	15 00
Wm. Smith, mare and colt,	25 00
Mrs. M. P. Smith, domestic goods,	3 00
Chauncey Stevens, harness,	7 00
John M. Sherwood, sheep,	10 00
B. A. Smith, poultry,	6 00
Mrs. Charles B. Sedgwick, single mare,	10 00
Mrs. Ann Soper, bonnet,	2 00
Miss Sarah Scofield, embroidery,	3 00
Throp, Smith, & Co., fruits,	24 00
Herman Treat, mare,	20 00
Mrs. Charles Taber, rag carpets,	2 00
Job Travis, horses,	10 00
J. S. Townsend, stock,	15 00
Mrs. Daniel Tuttle, quilt,	2 00
Mrs. James T. Van Namee, dom. man., flowers, &c.,	48 00
R. D. Van Duzer, mules,	10 00
J. & J. N. Voulk, Implements,	2 00
John H. Vail, potatoes,	3 00
C. Van Benthuysen, premium expenses,	457 07
C. M. Widrig & Co., implements,	91 00
John G. Williams, cattle,	15 00
Heber Walsh, Poultry,	2 00
J. S. Wadsworth, cattle,	76 00
C. S. Wainwright, stock,	54 00
F. M. Wilcox, horses, &c.,	34 00
J. G. Widrig, vegetables, grain, &c.,	17 00
John Wormley, churn,	5 00
E. H. Wurts, stallion,	15 00
H. N. Washbon, bull,	5 00
M. B. Wheeler, hearth rug,	3 00
J. H. Wells, stallion,	25 00
Wm. Webster, buck,	10 00
E. Woolverton, cheese press,	5 00
S. Whipple, stallion,	5 00
Doct. N. Winton, fruit,	7 00
S. A. Winslow, horse,	25 00
John Wilson, boquet,	3 00
Miss Mary Weed, embroidery,	3 00

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P.—Fair expenses, business office, clerk and treasurer,	$450	00
N.—Superintendents,	323	75
Gate tenders and police,	165	00
Expenses fair, Elmira,	1,032	23
Refreshments for judges,	500	00

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TOWN ASSOCIATIONS.

We have received notice of the formation of the following town associations. Some of them have been in successful operation for several years:

Bedford Farmers' Club, Westchester county—John A. How, President; J. S. Holmes, Secretary; J. H. Green, Treasurer.

Brookfield Town Association, Madison county—Herman A. Hull, President; A. C. Saunders, Secretary; J. T. G. Bailey, Treasurer.

Canaseraga, Allegany county—Wm. M. White, President; W. B. Battin, Secretary; J. W. Lemen, Treasurer.

Farmers' and Gardeners' Club, Pomfret, Chautauque county—D. J. Matteson, President; A. S. Moss, Vice-President; J. Hamilton, Jr., Secretary.

Farmers' Club, Skaneateles, Onondaga county—Wm. M. Beauchamp, Secretary; P. Whittlesey, Treasurer.

Farmers' Club, Cleveland, Oswego county—Wm. Lyon, President; Henry W. Dickinson, Secretary.

Galen, Wayne county—Adam Fisher, President; Joseph Watson, Secretary.

Harpersfield Agricultural Society, Delaware county—R. B. Gibbs, President; N. M. Dart, Secretary; J. B. Bragg, Treasurer.

Phelps Agricultural Society, Ontario county—E. Willard Frisbee, President; William Dillon, Secretary; H. H. Frazer, Treasurer.

Rushville, Yates county, (comprising three towns)—Guy Shaw, President.

Tonawanda Valley Agricultural Society and Farmers' and Mechanics' Association, Attica, Genesee county—Ezra Bishop, President; S. Folsom, Secretary; E. Colton, Treasurer.

Vernon Agricultural Association, Oneida county—Fitch Howes, President; Levi T. Marshall and Josiah Chase, Secretaries.

Virgil Town Society, Cortland county—Stephen G. Jones, President; Monroe Frank, Secretary; Sanford Bouton, Treasurer.

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AWARD OF PREMIUMS

AT THE FIFTEENTH ANNUAL EXHIBITION, HELD AT ELMIRA, CHEMUNG COUNTY, OCTOBER, 1855.

CLASS I.—CATTLE.

No. 1. SHORT HORNS—BULLS.

John Grant, Skaneateles, Onondaga county, best bull 3 years old and upwards, "Cayuga," $25

Cook, Greene & Co., Bellville, Jefferson county, 2d best do, "Sir Arthur," 15

W. B. Oakley, Southport, Chemung county, 3d best do..... 5

Best bull 2 years old, (not awarded.)

Dudley Culver, Pine Plains, Dutchess county, 2d best bull 2 years old, "Romeo," 10

Charles W. Bathgate, Fordham, Westchester county, 3d best do "Majesty,"..... 5

J. M. Sherwood, Auburn, Cayuga county, best bull 1 year old, "Red Jacket,"..... 15

S. P. Chapman, Clockville, Madison county, best bull calf, "Duke of Oxford," 5

W. T. & N. Chappell, Avon, Livingston county, 2d best do, "Young John,".....Trans. and 3

The bull Halton, (11,552,) owned by S. P. Chapman, of Clockville, Madison county, having received the first prize previously, a Diploma is awarded.

No. 6. SHORT HORNS—BULLS, (IMPORTED.)

Hungerford, Brodie & Converse, Ellisburgh, Jefferson county, best bull, 3 years old and upwards, "St. Nicholas," $25

SANFORD HOWARD, Boston.

Hon. REUBEN WILBUR, Troy, Bradford co., Pa.

RICHARD PECK, Lima.

No. 1. SHORT HORNS—COWS.

S. P. Chapman, Clockville, Madison county, best cow, 3 years old and upwards, "Duchess," $25

S. P. Chapman, Clockville, Madison county, 2d best do, "Ruby 2d,"..... 15

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G. W. Ostrander, Hoosick, Rensselaer, county, 3d best do, "Diadem," $5
G. W. Ostrander, Hoosick, Rensselaer county, best heifer, 2 years old, "Flora," 20
I. G. Williams, Ithaca, Tompkins county, 2d best do, "Pet," 10
I. G. Williams, Ithaca, Tompkins county, 3d best do, "Nancy Dawson," 5
S. P. Chapman, Clockville, Madison county, best heifer, 1 year old, "Hilpa 5th," 15
J. M. Sherwood, Auburn, Cayuga county, best heifer calf, "Red Rose 9th," 5
S. P. Chapman, Clockville, Madison county, 2d best do, "Bright Eyes 5th," .....Trans. and 3

DISCRETIONARY PREMIUM.

G. W. Ostrander, Hoosick, Rensselaer county, heifer, "Fanny," S. S. Medal.

No. 6. SHORT HORNS—COWS, IMPORTED.

S. P. Chapman, Clockville, Madison county, best cow, 3 years old and upwards, "Frantic," $25
Hungerford, Brodie & Converse, Ellisburgh, Jefferson county, best heifer, 2 years old, "Lady Newham," 20
J. S. Wadsworth, Geneseo, Livingston county, best heifer, 1 year old, "Music," 15

HIGHLY COMMENDED.

Two cows owned by I. G. Williams, Ithaca, Tompkins county.
Two cows owned by J. W. Taylor, Ontario county.

AARON CLEMENT, Philadelphia.
L. CHANDLER BALL, Hoosick Falls.
JESSE CARPENTER, Southport.

No. 2. DEVONS—BULLS.

L. H. Colby, Groton, Tompkins county, best bull, 3 years old and upwards, "Valiant," $25
Ira H. Coleman, Farmer, Seneca county, 2d best do, "Baltimore," 15
H. N. Washbon, Morris, Otsego county, 3d best do, "Baltimore," 5
Sylvanus Burtis, Phelps, Ontario county, best bull, 2 years old, "Washington," 20
E. C. Bliss, Westfield, Chautauque county, 2d best do, "Bonaparte," 10
Anson Dart, Harpersfield, Delaware county, 3d best do, "Majesty," 5

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Edw'd G. Faile, West Farms, Westchester county, best bull, 1 year old, "Tecumseh," $15
L. H. Colby, Groton, Tompkins county, 2d best do, "Albert," 10
Thomas Gould, Aurora, Cayuga county, 3d best do, "Ureka," 5
Edw'd G. Faile, West Farms, Westchester county, best bull calf, "Pontiac," 5
Sylvanus Burtis, Phelps, Ontario county, 2d best do, "Albert America," .....Trans. and 3

A. L. ELWYN, Phil., Pa.
A. G. PERCY, Newark.
S. A. COLLINS, Geneva.

No. 2. DEVONS—COWS.

C. S. Wainwright, Rhinebeck, Dutchess county, best cow, 3 years old and upwards, "Editha," $25
Enoch Ottley, Phelps, Ontario county, 2d best do, "Curl No. 9," 15
Ira H. Coleman, Farmer, Seneca county, 3d best do, "Eliza," 5
Enoch Ottley, Phelps, Ontario county, best heifer, 2 years old, "Heroine," 20
C. S. Wainwright, Rhinebeck, Dutchess county, 2d best do, "Donna," 10
L. H. Colby, Groton, Tompkins county, 3d best do, "Lovely," 5
C. S. Wainwright, Rhinebeck, Dutchess county, best heifer, 1 year old, "Helena 4th," 15
E. G. Faile, West Farms, Westchester county, 2d best do, "Fleda," 10
L. H. Colby, Groton, Tompkins county, 3d best do, "Curly," 5
Enoch Ottley, Phelps, Ontario county, best heifer calf, "Fairy," 5
E. G. Faile, West Farms, Westchester county, 2d best do, "Panzy," .....Trans. and 3

No. 7. DEVONS—COWS, (IMPORTED.)

E. G. Faile, West Farms, Westchester county, best cow, 3 years old and upwards, "Jennie," $25
E. G. Faile, West Farms, Westchester county, best heifer, 2 years old, "Zetania," 20
E. G. Faile, West Farms, Westchester county, best heifer, 1 year old, "Cleopatra," 15

G. W. COFFIN, Amenia.
THOMAS WHITE, Sandusky.
CHAS. H. BURTIS, Oaks Corners.

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No. 3. HEREFORDS.

M. C. Remington, Sennett, Cayuga county, best bull, 3 years old and upwards, "Defiance," $25
G. J. Pumpelly, Owego, Tioga county, 2d best do, "Mystery," 15
M. C. Remington, Sennett, Cayuga county, best bull, 1 year old, "Climax" 15
W. H. Sotham, Owego, Tioga county, 2d best do, "Hope," 10
W. H. Sotham, Owego, Tioga county, best bull calf "Marmion," 5
M. C. Remington, Sennett, Cayuga county, 2d best do, Trans. and 3
John H. Lapham, Penn Yan, Yates county, best cow, 3 years old and upwards, "Rose," 25
W. H. Sotham, Owego, Tioga county, 2d best do, "Milkmaid," 15
W. H. Sotham, Owego, Tioga county, 3d best do, "Bright Eyes," 5
M. C. Remington, Sennett, Cayuga county, best heifer, 2 years old, "Venus," 20
W. H. Sotham, Owego, Tioga, county, 2d best do, "Lady," 10
W. H. Sotham, Owego, Tioga county, best heifer, 1 year old, "Blonde," 15
M. C. Remington, Sennett, Cayuga county, 2d best do, "Dahlia," 10
John H. Lapham, Penn Yan, Yates county, best heifer calf, 5
W. H. Sotham, Owego, Tioga county, 2d best do, "Gentle," Trans. and 3

No. 8. HEREFORDS—(IMPORTED.)

W. H. Sotham, Owego, Tioga county, best cow, 3 years old and upwards, "Bombazine," $25

M. H. LAWRENCE, Penn Yan.
NOAH HITCHCOCK, Jr., Homer.
WINTHROP BULLARD, Lyme, Ohio.

No. 4. AYRSHIRES.

A. B. Conger, Haverstraw, Rockland county, best bull, 3 years old and upwards, "Marmion 2d," $25
A. B. Conger, Haverstraw, Rockland county, best cow, 3 years old and upwards, "Red Lady," 25
Hungerford, Brodie & Converse, Ellisburgh, Jefferson county, best heifer, 2 years old, "Lady Gowen," 20
Hungerford, Brodie & Converse, Ellisburgh, Jefferson county, best heifer, 1 year old, "Flora," 15

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Hungerford, Brodie & Converse, Ellisburgh, Jefferson county, 2d best do, "Bessie," $10

No. 9. AYRSHIRES—(IMPORTED.)

Hungerford, Brodie & Converse, Ellisburgh, Jefferson county, best cow, 3 years old and upwards, "Mary Gray," 25

Hungerford, Brodie & Converse, Ellisburgh, Jefferson county, best heifer, 2 years old, "Lady Ayer," 20

M. H. LAWRENCE, Penn Yan.
NOAH HITCHCOCK, Jr. Homer
WINTHROP BULLARD, Lyme, Ohio.

No. 11. GRADE CATTLE—COWS.

J. S. Wadsworth, Geneseo, Livingston county, best cow, 3 years old and upwards, ... $25

J. S. Wadsworth, Geneseo, Livingston county, 2d best do, . 15

Lafayette Smith, Southport, Chemung county, 3d best do,.. 5

E. S. Buck, Elba, Genesee county, best heifer, 2 years old, "Know-Nothing," 20

E. S. Buck, Elba, Genesee county, 2d best do, "Lucy," ... 10

Martin Lowman, Chemung, Chemung county, best heifer, 1 year old,..... 15

DISCRETIONARY PREMIUMS.

H. Farr, Big Flats, 1 pair of twin calves, ...Vol. Trans.

Uri Balcom, Corning, Steuben county, a fine heifer, ...Diploma.

LAURENS HULL, Chairman, of committee.

No. 12. NATIVE—COWS.

J. B. Clark, Chemung, Chemung county, best cow, 3 years old and upwards,..... $25

Uri Balcom, Corning, Steuben county, 2d best do, ... 15

J. B. Clark, Chemung, Chemung county, 3d best do, ... 5

SAMUEL HARVEY, Mansfield.
JEHIEL FREEMAN, York.
JAMES GILMER.

No. 13. WORKING OXEN.

Chemung county, D. K. Fitch and others, best team of 20 yoke from any county,..... $50

Elmira, D. K. Fitch and others, best team from any town, ten yoke, ... 25

Geo. Juliand, Greene, Chenango county, best yoke of oxen,.. 20

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Geo. Juliand, Greene, Chenango county, 2d best do,..... $15
Clark Hyatt, Owego, Tioga county, 3d best do,..... 5

DAVID CROCKER, Jr., Genoa Five Corners.
MARTIN HOLMES, Dundee.
DANIEL D. AIKEN, Pawlings.

No. 14. STEERS—3 YEARS OLD.

Samuel Leverich, Southport, Chemung county, best single yoke, ... $10
Stephen Leggett, Henrietta, Monroe county, 2d best do,.... 8
H. Howland, Auburn, Cayuga county, 3d best do, Trans and 3
To boys under 16, training yoke of steers best, Jesse Leverich, Southport, Chemung county, ...Silver Medal.

NOAH H. ROBINSON, Elmira.
J. W. BALL, Schuyler's Lake.

No. 15. STEERS—2 YEARS OLD.

Uri Balcom, Corning, Steuben county, best single yoke, ... $10
M. C. Remington, Sennett, Cayuga county, 2d best do, ... 8
Martin Roberts, Henrietta, Monroe county, 3d best do, Trans. and 3

ONE YEAR OLD.

Martin Roberts, Henrietta, Monroe county, best single yoke, $8
J. B. Clark, Chemung, Chemung county, 2d best do, ... 5

O. F. MARSHALL, Wheeler.
DANIEL S. BAKER, West Bloomfield.
JOHN CRAWFORD, Moreland.

No. 16. MILCH COWS.

John Holbert, Chemung, Chemung county, best milch cow, $20

GUY C. HINMAN, Catharines,
WM. R. BOOTH, Rochester.

No. 17. FAT CATTLE.

J. Freeman, York, Livingston county, best ox, 4 years and under 5 years, ... $10
James S. Wadsworth, Geneseo, Livingston county, 2d best do.,..... 6
James S. Wadsworth, Geneseo, Livingston county, 3d best do.,..... 4
J. Freeman, York, Livingston county, best cow, 4 years and upwards, ... 10
J. Freeman, York, Livingston county, 2d best do.,..... 6
G. J. Pumpelly, Owego, Tioga county, 3d best do., ... 4

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J. S. Wadsworth, Geneseo, Livingston county, best steer, 3 years old,..... $8
J. S. Wadsworth, Geneseo, Livingston county, 2d best do,. 3
Craig Wadsworth, Geneseo, Livingston county, 3d best do., Trans.
H. Howland, Auburn, Cayuga county, best heifer 3 years old, 8
Edmund Miller, Southport, Chemung county, pair of fat oxen, over 5 years old,..... Dip.

Hon. A. B. DICKINSON, Hornby.
GEO. JULIAND, Greene.
JESSE CARPENTER, Southport.

No. 18. FOREIGN CATTLE.

Hon. Adam Fergusson, Woodhill, Canada West, best short horn bull, 2 years old and upwards, "Victor," Diploma and $15
B. H. Andrews, Waterbury, Ct., best Devon bull, Dip. and 15
B. H. Andrews, Waterbury, Ct. best cow,..... 15

DISCRETIONARY PREMIUM.

Jesse Edsell, Bradford county, Pa., grade cow, ... 10

R. H. VAN RENSSELAER, Morris.
C. S. WAINWRIGHT, Rhinebeck.

CLASS II.—HORSES.

No. 19. FOR ALL WORK—STALLIONS.

D. Christopher, Varick, Seneca county, best stallion, 4 years "Young Crockery Eclipse," $25
Wm. M. Rysdyke, Chester, Orange county, 2d best do, "Hamiltonian," 15
Thos. Gould, Aurora, Cayuga county, 3d best do, "Black Hawk Hero," 5
L. Pratt, Portland, Chautauque county, 4th best do, "Rock Planter, ...Silver Medal.

DISCRETIONARY.

Russell N. Isaacs, "Trustee jr.,".....S. Medal.
Alpheus Morse, "Kentucky Hunter,".....S. Medal.
F. H. Smith, "Grey Morgan," .....S. Silver Medal.
B. B. Bundy, "English Coacher,".....S. Silver Medal.
Wm. M. Rysdyke, "Black Plato," .....S. S. Medal.
H. Platt, Tompkins county, "Iron Grey,".....Trans.
James H. Burke, Cortland county, "Mountain Eagle,"....Trans.
Orin G. Pennel, Orleans county, "America," .....Trans

JOSEPH CROCKER, Kings Ferry.
H. S. BROOKS, Painted Post.
L. S. MAY, Phillipsville.
W. HUTCHINSON, Watsontown, North Pa.

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No. 19. FOR ALL WORK—MARES

Wm. Smith, Chemung county, best brood mare, (with foal at her foot, 4 years and upwards, ... $25
O. Cady, Dryden, Tompkins county, 2d best do,..... 15
John Holbert, Chemung, Chemung county, 3d best do, ... 5
Phillip P. V. Dorn, Chemung, Chemung county, 4th best do, Youatt.

GEORGE WAGONER, Penn Yan.
J. W. HYDE, Darien.
WM. WORDEN, Veteran.

No. 20. DRAUGHT.

S. A. Winslow, Bristol, Ontario county, best stallion, 4 years and upwards,..... $25
Chs. Peck, Canal P. O., Cayuga county, 2d best do,..... 15
O. Howland, Auburn, Cayuga county, 3d best do, ... 5
F. H. Smith, Almond, Allegany county, 4th best do,....Youatt.

N. B. MANN, Sparta.
W. P. NOTTINGHAM, Palmyra.
J. W. EDSON, Machias.

A special list of matched draught horses referred to above committee, who reported that there were none exhibited worthy of the Society's premiums.

No. 21. THOROUGH BRED.

J. W. Wells, Saratoga Springs, best stallion, 4 years old and upwards, "Tornado," $25
J. S. Townsend, Southport, Chemung county, 2d best do, "Young Bell Founder," 15
Sam'l Whipple, Barton, Tioga county, 3d best do, "Young Shark," 5

SAXTON SMITH, Putnam Valley.
J. H. JACKSON, Hamptonburgh.
E. L. B. CURTIS, Danby.

No. 22. THREE YEARS OLD.

Wm. A. Cook, Lima, Livingston county, best stallion, 3 years old,..... $20
Herman Treat, Auburn, best mare, ... 20
Chas. Leggett, Henrietta, Monroe county, 2d best do,..... 10
O. Howland, Auburn, 3d best do,..... 5

R. L. ALLEN, Saratoga Springs,
JAMES SUFFERN, Suffern,
MARCUS BORST, Lawyersville.

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No. 23. 2 YEARS OLD.

Alanson Sherman, Palmyra, Wayne county, best stallion, 2 years old, "Young Norman," $15
Edward Jones, Clyde, Wayne county, 2d best do, "Black Hawk," 10
J. D. Remington, Auburn, 3d best do, "Morgan Black Hawk," .....Youatt.

COMMENDED.

Henry Barksman, Broome, Schoharie county, brown colt, S. S. Medal.
Stephen Brown, Greene Hill, Chemung county, best mare, $15
A. J. Wynkoop, Chemung, Chemung county, 2d best do,... 10

No. 24. 1 YEAR OLD.

David Dunn, Portland, Chautauque county, best stallion, 1 year old, ... 10
G. S. Munfort, Portland, Chautauque county, 2d best do,.. 5
Edward Shute, Horseheads, Chemung county, 3d best do, "Young Eagle," .....Youatt
J. S. Holbert, Chemung county, best mare,..... $10
Nathan Coryell, Havana, Schuyler county, 2d best do, "Katy Clay," 5

B. E. BOWEN, Mexicoville.
CHAS. S. MACK, Lockport.
JOHN WOODWARD, North Hector.

No. 25. MATCHED HORSES—For Road or Carriage.

L. S. Sprague, Williamson, Wayne county, best pair matched sorrel horses, 16 hands and over,..... $15
Dr. Edwin Eldridge, Elmira, 2d best do, bay horses, ... 10

COMMENDED.

Josiah Barber, Auburn, very fine span brown horses, nearly equal to premium horses,.....Youatt.
Major A. Field, Corning, pair gray horses, very desirable carriage horses, ...Trans.

HIRAM U. BOSTWICK, Corning
ARTHUR S. COPEMAN, Utica
ALPHEUS MORSE, Eaton

No. 26. MATCHED HORSES—For Road or Carriage.

Joseph Lyon, Hector, Schuyler county, best pair of matched horses, 15 to 16 hands, ... $15
Job Traverse, Clyde, Wayne county, 2d best do, ... 10

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COMMENDED SPECIALLY.

S. D. Wilder, Geneva, pair of bay horses, ...Youatt.

ED. DOUGLASS, Meredith.
BENJ. J. COWLES, Otisco.
S. H. WHITCOMB, Belvidere.

No. 27. MATCHED HORSES—For Road or Carriage.

N. H. Northrup, Elmira, best pair of matched horses, 14 to 15 hands, ... $15
Wilson Merritt, Genoa, Cayuga county, 2d best do, ... 10

L. B. DAVIS,
W. P. RANDALL, Cortland.
JAMES M. ELLIS, Syracuse.

No. 28. MATCHED TROTTING HORSES—For road.

David M. Grant, Buffalo, best pair,..... $15

LEVI J. COOLEY, Elmira,
JOSEPH S. LEWIS, Geneva.

No. 29. GELDINGS.

S. S. Norton, Oneida county, best gelding, ... $10
Sa'l Miner, Elmira, 2d best do,..... 8

DISCRETIONARY.

Sam'l B. Cole, Phelps, Ontario county, for three year old gelding colt, ... $5
F. P. Ely, Hector, Schuyler county, 3 year old gelding, 2d pr.,..... 3
J. W. Spoor, Nunda, Livingston county, 3 year old Morgan poney, "Little Tiger," 3
Hosea Pearce, Nunda, Livingston county, for training the above poney, ...Trans.

CHS. JONES, Moscow.
F. M. WILCOX, Owego.
JAS. P. ROSS, Spencerport.

No. 30. SINGLE MARES.

Mrs. Chs. B. Sedgwick, Syracuse, best,..... $10
Col. D. Avery, Ithaca, 2d do, ... 8
Several others nearly equal to the premium awards.

N. B. MANN, Sparta.
W. P. NOTTINGHAM, Palmyra.
J. W. EDSON, Machias.

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No. 31. SINGLE TROTTING HORSE, MARE OR GELDING—
IN HARNESS.

Otis Bort, Utica, best, ... $10
M. Hartshorn, Angelica, 2d do, ... 8

DISCRETIONARY.

H. L. Hodge, East Bloomfield, for carriage horse—trotting, ... Trans.

E. MERRIAM, Leyden.
W. MOORE, Paris.
M. M. SMITH, Lowville.

No. 32. FROM OTHER STATES AND CANADA.

J. F. Davis, North Springfield, Vermont, best blood stallion, 4 years and upwards, ... $15
E. H. Wurts, Canada West, best draught stallion, 4 years and upwards, ... 15

JOSEPH CROCKER, King's Ferry.
L. S. MAY, Cuba.
ALEXANDER GRAHAM, Burdett.

No. 33. JACKS AND MULES.

F. F. Foster, Batavia, 3d prem., ... $10
R. D. Van Duzen, Waverly, Tioga county, pair mules, 3d premium, ... 10

GREEN M. TUTHILL, Elmira.
LEWIS BEARDSLEY, Catherines
Dr. G. W. HOLBROOK, Elmira

CLASS III—SHEEP.

No. 34. FAT SHEEP.

O. Howland, Auburn, best fat sheep, long wooled, 2 years and upwards, ... $5
O. Howland, Auburn, best long wooled, under 2 years, ... 5
John H. Lapham, Penn-Yan, two very fine fat sheep, equal to the best, overlooked on account of entry, ... 5
Harrison Howland, Auburn,, best middle-wooled, 2 years and upwards, ... 5
O. Howland, Auburn, 2d best do, ... 3
H. Howland, Auburn, best middle-wooled, under 2 years, 5
O. Howland, Auburn, 2d best do, ... 3
O. Howland, Auburn, best cross breed, 2 years and upwards, ... 5
H. Howland, Auburn, 2d best do, ... 3

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O. Howland, Auburn, best cross breed, under 2 years,.... $5
H. Howland, Auburn, 2d best do, ... 3

GEO. SNYDER, Rhinebeck.
WM. WEBSTER, Sennett.

No. 35. LONG-WOOLED.

Hungerford, Brodie & Converse, Ellisburgh, Jefferson county, best buck, 2 years and upwards,..... $10
Jacób Albright, McLean, Tompkins county, 2d best do,.. 8
Richard Gypson, Westmoreland, Oneida co., 3d best do,.. 5
Wm. Webster, Sennett, Cayuga county, best buck, under 2 years,..... 10
Jacob Albright, McLean, Tompkins county, 2d best do,... 8
E. G. Cook, Bellville, Jefferson county, 3d best do,..... 5
Hungerford, Brodie & Co., Ellisburgh, Jefferson county, best pen ewes, 2 years and upwards, ... 10
Hungerford, Brodie & Co., Ellisburgh, Jefferson county, 2d best do,..... 8
Jacob Albright, McLean, Tompkins county, 3d best do,... 5
Hungerford, Brodie & Co., Ellisburgh, Jefferson county, best pen 5 ewes, under two years,..... 10
Hungerford, Brodie & Co., Ellisburgh, Jefferson county, 2d best do,..... 8
Hungerford, Brodie & Co., Ellisburgh, Jefferson County, best pen buck lambs, ... 5
Wm. Webster, Sennett, Cayuga county, 2d best do,
Morrell's Shepherd.
Hungerford, Brodie & Co., Ellisburgh, Jefferson county, best pen ewe lambs, ... 5
Wm. Webster, Sennett, Cayuga county, 2d best do,.....Trans.

DISCRETIONARY.

Hungerford, Brodie & Co., Ellisburgh, Jefferson county, for a fine buck, Certificate as best buck shown, having received 1st premium before.

G. C. BRADLEY, Pamelia.
FRANCIS E. WINSLOW, West Henrietta.
GEO. SHAPLAND, Spafford.

No. 36. MIDDLE WOOLED

Clark Hyatt, Nichols, Tioga county, best buck, under 2 years, ... $10
J. M. Sherwood, Auburn, best pen ewes, 2 years and upwards, ... 10

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Clark Hyatt, Nichols, Tioga county, 2d best do, ... $8
John M. Sherwood, Auburn, best pen buck lambs, ... 5
H. N. Washbon, Morris, Otsego county, 2d best do,
Morrell's Shepherd.
John M. Sherwood, Auburn, best pen ewe lambs, ... $5
H. N. Washbon, Morris, Otsego county, 2d best do,
Morrell's Shepherd.

WM. C. PARSONS, Penn-Yan
WALTER AKENHEAD, Lyons.
ELIAS W. CADY, Dryden.

No. 37. MERINOES.

Reed Burritt, Burdett, Schuyler county, best buck, 2 years and upwards,..... $10
N. M. Dart, Harpersfield, Delaware county, 2d best do,... 8
G. R. Burritt, Burdett, Schuyler county, 3d best do, ... 5
Reed Burritt, Burdett, Schuyler county, best buck, under 2 years,..... 10
G. R. Burritt, Burdett, Schuyler county, 2d best do,..... 8
N. M. Dart, Harpersfield, Delaware county, 3d best do,.... 5
Reed Burritt, Burdett, Schuyler county, best pen 5 ewes, 2 years and upwards,..... 10
Allen Jeffry, Elmira, 2d best do,..... 8
N. M. Dart, Harpersfield, Delaware county, 3d best do,.... 5
N. M. Dart, Harpersfield, Delaware county, best pen ewes, under 2 years, ... 10
Reed Burritt, Burdett, Schuyler county, 2d best do, ... 8
N. M. Dart, Harpersfield, Delaware county, best pen buck lambs, ... 5
Reed Burritt, Burdett, Schuyler county, 2d best do,
Morrell's Shepherd.
Reed Burritt, Burdett, Schuyler county, best pen ewe lambs, ... $5
N. M. Dart, Harpersfield Delaware county, 2d best do,
Morrell's Shepherd.
The sheep exhibited by Joseph Haswell, of Hoosick, Rensselaer county, were not on the ground in time for examination, to compete with the foregoing: in symmetry, condition and general appearance, they were without competition,.....Diploma.

J. S. CLARK, Auburn.
H. HITCHCOCK, South Livonia.
46 D. R. STILLMAN, Alfred.

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No. 38. SILESIAN MERINOES.

Wm. Chamberlain, Redhook, Dutchess county, best buck, 2 years and upwards, ... $10
Reod Burritt, Burdett, Schuyler county, 2d best do, ... 8
Wm. Chamberlain, Redkook, Dutchess county, 3d best do,. 5
Wm. Chamberlain, Redhook, Dutchess county, best buck, under 2 years, ... 10
Wm. Chamberlain, Redhook, Dutchess county, best pen ewes, 2 years and upwards,..... .. 10
Wm. Chamberlain, Redhook, Dutchess, county, best pen buck lambs, ... 5
Wm. Chamberlain, Redhook, Dutchess county, best pen ewe lambs, ... 5

CHS. H. RICHMOND, Aurora.
N. M. DART, North Harpersfield.

No. 39. FRENCH MERINOES.

Wm. Chamoerlain, Redhook, Dutchess county, best buck 2 years and upwards, ... $10
Wm. Chamberlain, Redhook, Dutchess county, 2d best do, 8
George Snyder, Rhinebeck, 3d best do, ... 5
Wm. Chamberlain, Redhook, Dutchess county, best buck, under 2 years, ... 10
Wm. Chamberlain, Redhook, Dutchess county, 2d best do, 8
Wm. Chamderlain, Redhook, Dutchess county, best pen ewes, 2 years and upwards, ... 10
Wm. Chamberlain, Redhook, Dutchess county, 2d best do, 8
Wm. Chamberlain, Redhook, Dutchess county, best pen buck lambs, ... 5
Wm. Chamberlain, Redhook, best pen ewe lambs, ... 5

DAN'L S. CURTIS, Canaan Center.
COOPER SAYER, Oak Corners.
JOB L. BABCOCK, Barrington.

No. 40. SAXONS.

Chs. Morrell, Lansing, Tompkins county, best buck, 2 years and upwards, ... $10
Chs. Morrell, Lansing, Tompkins county, 2d best do, ... 8
Chs. Morrell, Lansing, Tompkins county, best buck under 2 years, ... 10
Chs. Morrell Lansing, Tompkins county, 2d best do, ... 8

JAMES M. ELLIS, Syracuse.
CURTIS C. HUMPHREY, Durham,

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No. 41. CROSS BREED, OF FINE WOOL—SAXONS AND MERINOES.

Wm. Chamberlain, Redhook, Dntchess county, best buck 2 years and upwards,..... $10
Joseph Haswell, Hoosick, Rensselaer county, 2d best do,.. 8
G. R. Burritt, Burdett, Schuyler county, 3d best do, ... 5
Joseph Haswell, Hoosick, best buck under 2 years,..... 10
Joseph Haswell, Hoosick, 2d best do, ... 8
G. R. Burritt, Burdett, 3d best do, ... 5
Joseph Haswell, Hoosick, best pen ewes, 2 years and upwards, ... 10
H. Howland, Auburn, 2d best do,..... 8
O. Howland, Auburn, 3d best do, ... 5
Joseph Haswell, Hoosick, best pen ewes, under 2 years, .. 10
Joseph Haswell, Hoosick, 2d best do,..... 8
G. R. Burritt, Burdett, 3d best do,..... 5
O. Howland, Auburn, best pen buck lambs,..... 5
Joseph Haswell, Hoosick, best pen ewe lambs, ... 5
O. Howland, Auburn, 2d best do,.....Morrell's Shepherd.
J. Haswell, Hoosick, best samples of wool, 5 fleeces, Silver Medal.

JOHN L. EASTMAN, Lodi.
A. BYINGTON, Carlton.
NELSON NOBLE, Covert.

No. 42. CROSS BREED, OF COARSE OR MIDDLE WOOL.

E. G. Cook, Bellville, Jefferson county, 3d best buck, 2 years, and upwards,..... $5
O. Howland, Auburn, best buck under 2 years, ... 10
O. Howland, Auburn, 2d best pen ewes, 2 years and upwards, ... 8
O. Howland, Auburn, 3d best do, ... 5
E. G. Cook, Bellville, Jefferson county, 2d best pen ewes, under 2 years, ... 8
E. G. Cook, Bellville, Jefferson county, best pen buck lambs, ... 5
O. Howland, Auburn, best pen ewe lambs, ... 5
O. Howland, Auburn, 2d best do,.....Morrell's Shepherd.

DISCRETIONARY.

Jacob Albright, McLean, Tompkins county, for 3 wether lambs, ...Diploma.

JOHN W. HAMLIN, Willink.
A. RILEY, East Aurora.
H. H. WOODWARD, Burdett.

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No. 43. FROM OUT OF THE STATE.

George Hartshorn, Rahway, New-Jersey, middle wooled, best buck, ... $10

No. 44. FROM OUT OF THE STATE.

George Campbell, Westminster, Vermont, merinoes, best buck, ... $10

H. K. MORRELL, Caroline Center.
L. D. CLIFT, Croton Falls.

SWINE.

No. 45. LARGE BREED.

Hungerford, Brodie & Converse, Ellisburgh, Jefferson county, best boar, 2 years old and upwards, "Yorkshire,".. $10

B. S. Carpenter, Elmira, best breeding sow, 2 years old and upwards; 10

A. B. Daniels, Deposit, Delaware county, 2d best do, grass breed, ... 5

S. P. Chapman, Clockville, Madison county, best lot of pigs, not less than 5, under 10 months, Berkshires, ... 8

S. P. Chapman, Clockville, Madison county, 2d best do,.. 4

SMALL BREED.

Gilson Malory, Macedon, Wayne county, best boar, 1 year old, Suffolk,..... 10

J. M. Sherwood, Auburn, best boar, 6 months, and under one year, Suffolk,..... 8

Elam C. Bliss, Westfield, Chautauque county, best breeding sow, one year old, Suffolk,..... 10

A. B. Conger, Haverstraw, Rockland, 2d best do, Essex,.. 5

J. M. Sherwood, Auburn, best sow, 6 months, and under 1 year, Suffolk, ... 8

Elam C. Bliss, Westfield, best lot of pigs, not less than 5, under 10 months, Suffolk, ... 8

C. S. Wainwright, Rhinebeck, 2d best do, Essex,..... 4

DISCRETIONARY.

Joseph Paxton, Catawissa, Pennsylvania, 4 very superior grass fed pigs, ...S. S. Medal.

JAMES M. REEDER, Starkey.
DANIEL EDWARDS, Little Genesee.

No. 46. POULTRY.

Heber Walsh, Elmira, 2d best lot, black Spanish, ... $2

B. A. Smith, Elmira, best lot of game,..... 3

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A. Colden, Elmira, best lot of buff or red Shanghai, ... $3
C. R. Colden, Elmira, 2d best do, ... 2
J. A. McWilliams, Elmira, best lot of gray Shanghai, ... 3
C. R. Colden, Elmira, 2d best do, ... 2
H. C. Greene, Big Flats, Chemung county, best lot of Dominique Shanghai, ... 3
B. A. Smith, Elmira, best lot of any other variety, ... 3
G. F. Potter, Elmira, 2d best lot of native, or dunghill fowls, not less than six in number, ... 2

TURKIES.

O. Howland, Auburn, 2d best pair of wild turkies, ... 2

DUCKS.

O. Howland, Auburn, best pair Muscovy, ... 3

GEESE.

O. Howland, Auburn, best pair common, ... 3
O. Howland, Auburn, best pair Bremen, ... 3
Evan Bechtol, Canton, Steuben county, best pair China, ... 3

GUINEA FOWLS.

O. Howland, Auburn, best lot, ... 3

RABBITS.

E. G. Billington, Elmira, best pair common, ... 3

RODFEY L. ADAMS, Lyons.
CHS. Y. CHATFIELD Painted Post.

CLASS IV — PLOWING, IMPLEMENTS AND MACHINERY.

No. 47. PLOWING MATCH.

C. M. Widrig, Elmira, 1st premium, ... $10
Robert Robson, Dundee, 2d premium, ... 8
John Witty, Owego, 3d premium, ... 6
Wm. P. Ottley, Phelps, Ontario county, double plow, special premium, ... 10
To Mr. Ottley's plowman, Henry Sodan, under 18 years of age, special, ... 6

DISCRETIONARY.

W. B. Leonard, of New-York, for dynamometer, ... S. Medal.

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No. 48. SPADING MATCH.

The spading for spring work, and not less than ten inches deep. The time allowed to do the work was one hour.

Isaac T. Greenwood, Elmira, best spading, 20 feet by 10, Silver cup, value $10
Phillip Hogan, Owego, 2d best do, ...Silver cup, value 8
John McDonough, Elmira 3d best do,.....Silver Medal.

WM. JOHNSON, Geneva.
PETER CRISPELL, Jr., Hurley.
S. W. PATTEN, Dundee.
ROBERT ENNIS, Lyons.
A. F. DICKINSON, Katonah.

No. 49. FARM IMPLEMENTS—No 1.

John C. Lace, best farm wagon,..... $5
E. L. Hagar, Frankfort, Herkimer county, best harrow,... 5
E. L. Hagar, Frankfort, Herkimer county, 2d best do, ... 3
Chautauque Company, Chautauque county, best corn cultivator, ... 5
C. M. Widrig & Co., Elmira, 2d best do,..... 3
Wm. Reynolds, Lyons, Wayne county, best fanning mill,.. 5
Stephen Stilwell, Waterloo, Seneca county, 2d best do, ... 3
D. C. Cummings, Fulton, Oswego county, best corn stalk cutter, ... 5
Alexander Gordon & Co., Rochester, best hay and straw cutter, ... 5
C. M. Widrig & Co., Elmira, 2d best do,..... 3
R. D. Granger, Philadelphia, best corn and cob crusher, by horse power,..... 5
Emery Brothers, Albany, 2d best do,..... 3
C. M. Widrig & Co., Elmira, best horse rake,..... 4
A. Brown, Westchester, 2d best do, ... 2
C. M. Widrig & Co., Elmira, best roller for general use,.. 5
C. Bartholomew, Etna, Tompkins county, 2d best do,..... 3

DISCRETIONARY.

J. S. & M. Peckham, Utica, for cultivator teeth,..... 5
J. & J. N. Voalk, Monterey, Schuyler county, for neck yoke for horses, ... 2
Silsbee, Mindeze & Co., for wagon hubs,..... 2
Winnie, Link & Co., Albany, wagon fellies, bent by steam, Diploma.

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J. D. Sanborne, Cowlesville, Wyoming county, Sanborn's corn stalk cutter, ...S. S. Medal.

THOS. WRIGHT, West Brighton.
ALEXANDER WILLIAMS, West Henrietta.
ALMOND BENJAMIN, Centerville.

No. 50. FARM IMPLEMENTS—No. 2.

Chancey Stevens, Syracuse, best carriage harness, ...	$5
Chancey Stevens, Syracuse, 2d best do, ...	2
Ellwell & Rathbone, Rome, best single harness,.....	5
Wm. Hoffman, jr. Elmira, best gent's riding saddle,.....	5
John Wormley, Elmira, best churn,.....	5
Henry Holmes, Grafton, Vermont, 2d best do,.....	2
Edwin Wolverton, Milan, Erie county, best cheese press, .	5
G. D. Harris & Co., Fitchburgh, Mass., 2d best do, ...	2
Charles Clow & Co, Port Byron, best grain cradle,.....	3
Kenney & Carpenter, Castile, Wyoming co., 2d best do,...	2
Gould, Henion & Co, Seneca Falls, best 6 hay forks,.....	3
Gould, Henion & Co., Seneca Falls, best 6 manure forks, .	3
C. M. Widrig & Co., Elmira, best potato digger, ...	3

DISCRETIONARY.

W. B. Stillman, Brookfield, Madison county, best half dozen hoes,.....S. S. Medal.

WM. P. OTTLEY, Phelps.
R. BLAUVELT, Suffern.
JOSHUA TANNER, Durham.

No. 51. FARM IMPLEMENTS—No. 3.

E. D. Hallock, Rochester, best portable saw mill, for wood fences, and farm use,.....	$10
C. M. Widrig, & Co., Elmira, best corn sheller, horse power,	8
Charles Clow & Co., Port Byron, best corn sheller, hand power,.....	6
C. M Widrig & Co., Elmira, best farm or road scraper,...	5
Brown, Jeffrey, & Co., Corning, Steuben county, best pump for farm use, Jeffrey's double acting, ...	5
C. M. Widrig & Co., Elmira, best and most numerous collection of agricultural implements,.....	25
C. M. Widrig & Co., Elmira, best and most numerous collection of agricultural implements, manufactured in the State of New-York, by or under the supervision of the exhibitor, materials, workmanship, utility, durability and prices to be considered in both cases, ...	25

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DISCRETIONARY.

Richard H. Pease, Albany, for portable cider mill, ...Diploma.
Warder, Brockaw & Child, Springfield, Ohio, portable cider mill, 2d prem.,.....Trans.
T. R. Riddell, New-York, butter worker,.....S. S. Medal.
T. C. PETERS, Darien.
JOHN V. GROVE, Sheldrake.
E. S. ELY, Williamsville.

No. 52. MACHINERY.

Trapp's patent barrel machinery, entered by M. H. Ferris, Elmira,.....Special notice and diploma.
Shingle machine, entered by Treman, Cortwright & Co., of Ithaca, ...Diploma.
Shingle machine, (Perry's improved) entered by Lyman Moore, agent, Howard, Steuben county,.....Diploma.
Woodsworth's planing, tonguing, and grooving machine, one surface planing machine, entered by John Gibson, Favorable notice.
J. Gibbs' patent plow grinder and polisher, entered by Joshua Gibbs, of Canton, Starke county, Ohio,..Diploma and special notice.
Horton's buckwheat huller and rye cleaner, entered by Horton & Smith, Elmira,.....Diploma.
Bramble's automatic hay scales, entered by S. G. Milligan & Co., Buffalo, ...Diploma and special notice.
Boring machine, for pump tubing, machine for fitting the ends, pump chain and tubing, patent valve for chain pumps for retaining water, entered by Nye & Wyckoff of Elmira,.....Diploma and special notice.
Two stave dressing and jointing machines, entered by L. D. Benson, Jackson, Pa.,.....Diploma.
Coe's patent self-feeding drill, entered by L. E. Hewitt, Fulton, Oswego county,.....Diploma
Shaving, grading, and creasing machine for saddles, harness and whip making; also 1 gang creasing machine, entered by Robert Wilson, of Milton, Penn., ..Diploma and favorable notice
Improved circular saw, and tool to keep it in order, entered by Nelson Barlow, of Newark, New-Jersey,.....Diploma.
One garden pump and fire engine, entered by Cowing & Co., of Seneca Falls.....Diploma

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Model brick molding machine, entered by J. Johnson, of Washington city, ...Favorable notice.

Two dozen axes, entered by Beardsley & Tyler, of Elmira, Favorable notice.

One model stump machine, entered by Francis Morris, Meadville, Pa., ...Favorable notice.

Self-acting car brake, entered by John LaHayes, of Penn., Diploma and favorable notice.

The corn planters exhibited, by J. Blackwood, Oren Stoddard, Borden & McClean, and Myron Ward, have each merits, and are worthy of favorable notice.

Roe's patent cheese fixture, entered by Henry A. Roe, of Ashtabula county, Ohio, and Daniel Roe, Rochester, Diploma and favorable notice.

Hildreth's iron gang plow and seed drill, entered by G. W. Hildreth, Lockport, ...Diploma and favorable notice.

Stone pipe, for water, gas and sewerage, entered by E. & D. Fosdick, & Co., Summit county, Ohio,.....Diploma and special notice.

One rotary fan blower, (Ruggles' patent) entered by G. D. Harris & Co.,.....Favorable notice.

Rotating yoke for bells: three church bells, one school house bell, and one factory bell, A Meneely Sons, of West Troy,.....Diploma and favorable notice.

Three church bells, Jones & Hitchcock, Troy, N. Y.,..Favorable notice.

Extension reach for wagons and carriages, Edwin Wilson, Steuben county, and noticed as a useful improvement, &c., ...Diploma.

Hay and cattle scales, coal dealers' scales, &c., E. & J. Fairbanks, Vermont, ...Diploma and notice.

Platform scales, A. Blake, Vergennes, Vermont, Diploma and notice.

One one horse cylinder stump machine extractor, R. H. Hall, Owego,.....Diploma.

New reaper and mower, Deits, Dunham & Trump, of Rariton, New-Jersey,.....Diploma.

Manny's combined reaper and mower, best combined machine, ...Diploma and favorable notice.

Wheeler's combined mower and reaper, Shrouds & Mosher, Cayuga county,..... ...Favorable notice.

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Reaping machine, by Sylla & Adams, Elgin, Illinois, Diploma and notice.

Mowing machine, entered by R. L. Allen, of New-York city,.....Diploma.

Self-raking reaper, &c., Palmer & Williams, Brockport, N. Y. good,.....Silver Medal.

tomaton reaper, H. D. Bennett, of Geneva, Diploma and favorable notice.

aper and mower, T. R. Hussey,....Favorable notice.

[illegible]s mower, best as a mower, (great collection of mowers and reapers, all good,) Diploma and favorable notice.

One ditching machine, Pratt & Brothers, Canandaigua, N. Y. most valuable implement for the farmer, Diploma and Silver Medal.

One tile machine, Pratt & Brothers, Canandaigua, best, Silver medal.

Liquid manure distributor, Finly Frazer, of Trenton, N. J. Diploma.

Bickford & Huffman, improved grain drill, &c., Macedon, New-York, ...Diploma.

Seymour's grain drill, improved, P. Seymour, East Bloomfield, ...Diploma.

Broad cast sower, P. Seymour, ...Diploma.

Grain drill, J. M. Harvey & Co., Amsterdam, New-York, Favorable notice.

Grain drill, Foster, Jesup & Co., Palmyra, ...Diploma.

Horse power and thrasher, Dow & Fowler, of Fowlerville, Livingston county, best, ...Diploma.

Horse power, B. H. Wakely, Tompkins co.,....Favorable notice.

Clover seed harvester, Jno. C. Birdsall, Monroe co., best, $5

Horse power, C. & L. Perigo, Tompkins county, ...Diploma.

Horse power, N. U. Tracy, Penn Yan,.....Favorable notice.

One thrashing machine, David Anthony, Schoharie county, Favorable notice.

Emery & Brothers, powers and machines, good,.....Favorable notice.

One smut machine, B. T. Treman, Monroe county, N. Y. good,.....Diploma.

Draining tile and pipe for drains, &c., John B. Dixon, best, $5

Patent gate opening, &c., C. Winegar, Cayuga county, good, Diploma and notice.

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Patent portable mortising machine, H. & S. H. Plumb, very good, ...Diploma.

Riving, shaving and jointing shingle machine, E. R. Morrison, ...Diploma.

One portable mill, for farm use, Ross & Davis, Rochester, Diploma and favorable notice.

Best collection of plows in use in this country, with prices attached, C. M. Widrig & Co., Elmira, Dip. and Silver medal.

Collection of plows, by R. Brinkerhoff, Batavia, deemed good, and worthy of .....Special notice.

Iron beam plow, (pointed plow,) well constructed, Wm. P. Ottley, Phelps, ...Special notice.

Improved iron beam plow, Robert Wilson, Burdett, Schuyler county, ...Diploma and favorable notice.

Two medium plows, N. U. Tracy, Penn Yan, good plows, Favorable notice.

Four iron beam plows, entered by S. S. Granger, of Horseheads, Chemung county, possessing merits and worthy of special notice.

The committee have examined all the plows (entered for competition) constructed upon newly invented principles and arrangements, and have discovered none which were deemed to "*prove beneficial to the farmer*," as some were too cumbersome in their parts, and others deficient in form to merit the premium offered.

Wynkoop's patent corn planter, entered by H. L. Edson, of Corning, N. Y., a valuable invention, Diploma and favorable notice.

Dietz's improved angular hame, as manufactured by the New-Jersey angular hame company, Diploma and favorable notice.

Model of hay and cotton press, entered by George Snyder, Rhinebeck, ...Diploma and favorable notice.

Model of patent saw mill dogs, entered by M. B. Royal, Favorable notice.

C. H. Williams, patent ball valve force and lift pump, entered by J. D Quackenbush; it is a valuable pump for garden purposes, is easily taken to pieces, and appears durable; worthy of special commendation.....Diploma.

The committee would remark generally, that the exhibition of machinery and farm implements is unusually large, presenting an agreeable feature to the fair, and which promises to be of great practical utility to the industrial classes.

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The unusual number of entries precluded the thorough examination of each article, which the committee desired to pursue; and the awards were, *necessarily*, the result of such investigation as the time and circumstances would warrant.

All of which is respectfully submitted.

GOLDSMITH DENNISTON. Prattsburgh.
GEORGE GEDDES, Fairmount.
JOHN M'CARTY, Catherines.
MOSES BEECHER, Ellicottville.

SPECIAL.

E. B. Williams, Gilead, Michigan, sheep shearing machine, ...S. Medal.

Kidder's patent gas regulator, exhibited by the New-York Gas Regulator Co. A dry meter, by Mr. Samuel Down, N. Y., operated from a flow of gas through the burner, of a most beautiful mechanical combination, by which the meter is alternately filled and discharged, and the number of feet properly recorded upon the dial, with an accuracy beyond the contingencies from changes of weather, S. Medal to Gas Regulator Co., and Diploma to Mr. Down for meter.

COMMITTEE ON STEAM ENGINES.

The undersigned appointed to examine steam engines, hereby report; that

One engine exhibited by Wm. H. Philips & Sons, Elmira; the arrangement was simple and plain for an ordinary engine, creditable to the mechanic,.....S. Medal.

One steam engine exhibited by Towsley and Reed, New-York, was a three horse power. Engine and boiler costs $350; a good oscillating engine,.....Diploma.

One case steam cocks and whistles, fitted up in the usual manner, but display an unusual degree in the perfection of workmanship: from Hadensville Comp., Mass., ...S. Medal.

One rotary steam engine and boiler, exhibited by John Fairbanks, (Carpenter and Dutton's patent,) Rochester, N. Y., Six horse power, price $600, ...S. Medal.

One stationary engine, exhibited by D. A. Woodbury, Rochester, N. Y.; built plain and simple, and is close and compact in its arrangement. 8 horse power. Engine and boiler costs $575; a cheap engine for the price. Built at Rochester,....Diploma.

One steam portable engine, exhibited by Dunning & Riley, Geneva, in the ordinary style. Readily set up in any position; 10 horse power; price $800, ...S. Medal.

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One steam engine, built by Asa Blevin, Elmira, a well finished engine, and substantially built,.....S. Medal.

Piece of forging done by Wm. Stevens of Elmira. This is a fork joint connection, fitted exclusively, with the hammer on the anvil. The connection and perfection of the joints, together with the true proportions of the parts, exhibits an unusual degree of skill and ability in the use of the hammer as a blacksmith,.....Trans.

In conclusion the committee would say, that the display of machinery was well got up, and its workmanship was creditable to the mechanic.

A. OSBORN, *Chairman.*
E. J. HORN,
JAMES B. GREGG,
SAM. SMITH.

CLASS V—GRAIN, SEEDS, VEGETABLES, &c.

No. 53. GRAIN AND SEEDS.

O. F. Marshall, Wheeler, Steuben county, best sample white winter wheat, not less than 1 barrel,..... $5

J. G. Widrig, Horseheads, Chemung county, 2d best do,... 3

J. G. Widrig, Horseheads, Chemung county, best sample red winter wheat, 1 bbl.,..... 5

W. P. Ottley, Phelps, Ontario county, 2d best do,..... 3

O. Howland, Auburn, Cayuga county, best sample white spring wheat, 1 bbl.,..... 5

W. P. Ottley, Phelps, Ontario county, best sample of oats, 1 bbl.,..... 5

O. Howland, Auburn, Cayuga county, 2d best do,..... 3

O. Howland, Auburn, Cayuga county, best sample of barley, 1 bbl.,..... 5

William P. Ottley, Phelps, Ontario county, 2d best do,... 3

William P. Ottley, Phelps, Ontario county, best sample of Indian corn, 1 bbl.,..... 5

O. Howland, Auburn, Cayuga county, best sample of buckwheat, 1 bushel,..... 3

G. W. Miller, Southport, Chemung county, 2d best do,.... 2

Henry Martin, Enfield, Tompkins county, best sample timothy seed, 1 bushel,..... 3

O. Howland, Auburn, Cayuga county, 2d best do,..... 2

J. G. Widrig, Horseheads, Chemung county, best sample of clover seed,..... 3

G. W. Hoffman, Elmira, Chemung county, 2d best do,.... 2

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J. G. Widrig, Horseheads, Chemung connty, best 12 ears yellow seed corn,..... $3
Lewis Beardsley, Catharines, Chemung county, 2d best do,. 2
Theodore Backus, Rochester, best 12 ears white seed corn, 3
N. Culver, Arcadia, Wayne county, best 12 ears sweet corn, 3
Uri Balcom, Corning, Steuben county, 2d best do,..... 2

DISCRETIONARY PREMIUMS.

W. P. Ottley, Phelps, Ontario county, sample white winter wheat, 3d best, ...Vol. Trans.
O. Howland, Auburn, Cayuga county, red winter wheat, 3d best,.....V. Trans.
J. G. Widrig, Horseheads, Chemung county, sample of oats, 3d best,.....V. Trans.
B. S. Carpenter, Elmira, Chemung county, sample of buckwheat, 3d best,.....V. Trans.
H. Morrison, Montgomery, Orange county, sample of timothy seed, 3d best, ...V. Trans.
W. P. Ottley, Phelps, Ontario county, sample clover seed, 3d best,.....V. Trans.
Walter Akenhead, Sodus, Wayne county, samples fine wheat, less than 1 bbl.,.....V. Trans.
G. W. Hoffman, Elmira, Chemung county, sample timothy seed, ...V. Trans.
W. P. Ottley, Phelps, Ontario county, sample of timothy seed, ...V. Trans.
Julius M. Lewis, Caton, Steuben county, half bushel spring wheat,.....V. Trans.
Richard Baker, Southport, Chemung county, King Philip corn, and California peas,.....V. Trans. & Inst.
E. B. Owen, Big Flats Chemung county, N. Y., 12 ears of corn, ...V. Trans.
N. Culver, Arcadia, Wayne county, 1 doz. yellow seed corn, V. Inst.
John Rapelje & Co., Rochester, five half barrels of garden peas, ...S. S. Medal.
T. Backus, Rochester, sampie of flour corn,.....S. S. Medal.
C. F. Crossman, Rochester, 12 ears Stowell evergreen corn, S. S. M.
James Hunt, Plattekill, Ulster county, two stalks mummy wheat, ...Norton's essay.
Barney Bundy, Henrietta, Monroe county, specimen Holland oats, ...V. Trans.

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H. D. Rice, Owego, Tioga county, 2 bushels California wheat,.....V. Trans.
H. C. White, Buffalo, 2 bushels extra timothy seed from Wisconsin, ...S. S. M.
B. S. Carpenter, Elmira, Chemung county, 12 ears white dent corn, ...Vol Inst.
R. T. Carpenter, Southport, Chemung county, 12 ears white seed corn,.....Vol. Inst.
George S. Rogers, Southport, Chemung county, 12 ears of yellow dent corn,.....Vol. Inst.
Jacob Elliott, Elmira, Chemung county, bbl. winter wheat, V. Trans.
Benj. C. Gray, Southport, Chemung county, 1 doz. ears of corn,.....Norton's Essay.
G. Washington Miller, Southport, Chemung county, sample of buckwheat,.....Norton's Essay.
Wm. Huffman, Elmira, sample of seed corn,.....Norton.
J. S. Baldwin, Southport, Chemung county, 12 ears of white seed corn, ...Norton.
T. J. Coulton, Elmira, sample of Swiss corn,.....Trans.
J. G. Widrig, Horseheads, Chemung county, early 6 week beans, ...Norton.
G. B. Mallett, Millport, Chemung county, half bushel of Millett seed, ...Trans.
H. C. Greene, Big Flats, Chemung county, sample chocolate corn, ...Norton.
Luce & Post, Southport, Chemung county, bbl. of oats, ..Trans.
J. W. Suffern, Southport, Chemung county, bbl. of winter wheat,.....Trans.
H. Morrison, Montgomery, Orange county, bushel timothy seed, ...Trans.
J. G. Widrig, Horseheads, Chemung county, 12 ears of sweet corn,.....Inst.
W. E. Bennett, Chemung, Chemung county, 1 bushel of buckwheat, ...Trans.
Jacob Lowman, Chemung, Chemung county, 12 ears of seed corn, ...Inst.
W. H. Sotham, Owego, Tioga county, seed oats, half bushel, Norton.

H. C. WHITE, Buffalo.
C. F. CROSSMAN, Rochester.

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No. 54. VEGETABLES.

Israel O. Scudder, Southport, Chemung county, twelve best stalks of celery, (seed from Patent Office.) $3
George M. Jones, Elmira, 2d best do, ... 2
Uri Balcom, Corning, Steuben county, six best heads of cauliflower, ... 3
John Brandt, Southport, Chemung county, 2d best do, ... 2
N. Culver, Arcadia, Wayne county, twelve best white table turnips, ... 3
E. G. Cook, Bellville, Jefferson county, 2d best do, ... 2
N. Culver, Arcadia, Wayne county, twelve best carrots, .. 3
C. F. Crossman, Rochester, 2d best do, ... 2
N. Culver, Arcadia, Wayne county, twelve best beets, ... 3
C. F. Crossman, Rochester, 2d best do, ... 2
C. F. Crossman, Rochester, twelve best parsneps, ... 3
Sam'l Leverett, Southport, Chemung county, 2d best do, .. 2
C. F. Crossman, Rochester, twelve best onions, ... 3
Theodore Backus, Rochester, 2d best do, ... 2
Joshua S. Holbert, Chemung, six best heads of cabbage, ... 3
Uri Balcom, Corning, Steuben county, 2d best do, ... 2
Theodore Backus, Rochester, 12 best tomatoes, ... 3
C. F. Crossman, Rochester, 2d best do, ... 2
C. F. Crossman, Rochester, two best purple egg plants, ... 3
John Brandt, Southport Chemung county, 2d best do, ... 2
N. Culver, Arcadia, Wayne county, 12 best sweet potatoes, 3
A. Frost & Co., Rochester, 2d best do, ... 2
N. Culver, Arcadia, Wayne, best half peck Lima beans, ... 3
C. F. Crossman, Rochester, 2d best do, ... 2
M. E. Baldwin, Chemung, best three heads lettuce, ... 3
N. Culver, Arcadia, Wayne, best 12 summer radishes, ... 3
Geo. W. Miller, Southport, Chemung county, best 12 winter radishes, ... 3
C. F. Crossman, Rochester, 2d best do, ... 2
Uri Balcom, Corning, Steuben county, best brocoli, or German greens, ... 3
Henry Barney, Elmira, best bunch double parsley, ... 3
C. F. Crossman, Rochester, 2d best do, ... 2
F. Lyon, Barton, Tioga county, 3 best garden squashes, ... 3
G. W. Miller, Southport, 2d best do, ... 2
J. G. Widrig, Horseheads, three best large squashes, ... 3
Geo. Benedict, Chemung, Chemung county, 2d best do, ... 2

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R. T. Carpenter, Southport, Chemung county, best field pumpkin, ... $3
W. S. Carpenter, Big Flats, Chemung county, 2d best do,.. 2
J. H. Vail, Chester, Orange, best half peck table potatoes,.. 3
O. Howland, Auburn, Cayuga, 2d best do,..... 2
N. Culver, Arcadia, Wayne, best and greatest variety of vegetables, presented in best condition, raised by the exhibitor, ... 10
C. F. Crossman, Rochester, 2d best do, ... 5

DISCRETIONARY PREMIUMS.

A. McWilliams, Elmira, display of vegetables, ...Vol. Trans.
E. C. Bliss, Westfield, Chautauque county, half peck of potatoes,.....V. Trans.
Alex'r Murray, Southport, Chemung county, 12 onions V. Trans.
Sam'l Leverett, Southport, Chemung county, squashes and pumpkins, ... Inst.
Wm. B. Oakley, Southport, Chemung, potatoes,..... Inst.
Mrs. G. W. Miller, Southport, superior dried apples,...S. S. M.
W. P. Ottley, Phelps, Ontario county, peck white beans,..Trans.
Israel O. Scudder, Southport, Chemung county, 12 pumpkins, ...Trans.
Israel O. Scudder, Southport, Chemung county, sample of kohl rabi, (seed from patent office,) .....Norton.
J. G. Widrig, Horseheads, Chemung county, half peck of potatoes, ...Trans.
G. W. Miller, Southport, Chemung county, 1 dozen carrots, very superior, ...Bridgeman's Gardener.
H. C. Green, Big Flats, Chemung county, 2 winter muskmelons, very fine,..... Inst.
Hamilton Morrison, Montgomery, Orange, 30 varieties of potatoes, (very good,) .....S. S. Medal.
E. W. Sylvester, Lyons, Wayne county, 1 dozen smooth tomatoes, ...Norton.
O. Howland, Auburn, Cayuga county, 1 dozen seedling potatoes, ...Trans.
A. G. Owen, Big Flats, Chemung county, 20 onions,....Trans.
E. C. Bliss, Westfield, Chautauque county, 1 dozen red peppers, ...Trans.
Dr. N. Winton, Havana, Schuyler county, variety of roots, from seed from Patent Office, poor specimens, award for industrial trial,.....Inst.
Theodore Backus, Rochester, 5 varieties of tomatoes,.....Trans.

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Wm. H. Sotham, Owego, Tioga county, 12 white sweet turnips, ... Inst.

J. RAPELJE, Rochester.
JAS. BRODIE, Rural Hill.

No. 55. FLOUR, &c.

Ross & Davis, Rochester, best barrel of flour, ... S. Medal.
Miss Anna Wynkoop, Chemung, best sample of starch from wheat, ... S. Silver Medal.
Henry Gaul, Buffalo, best sample domestic wheat bread and yeast cakes, ... S. Silver Medal.
Henry Barney, Elmira, best sample of dried apples, not less than half a bnshel, ... S. Silver Medal.

DISCRETIONARY.

O. P. Prall, N. Y., for Crum & Paul's, patent bread, ... S. S. M.
Chas. R. Barnes, Owego, Tioga county, for rye and buckwheat flour, ... S. Silver Medal.
A. Rowe & Co., Bath, Steuben county, a very superior barrel of flour, statement not received in time, the Society award, ... S. Medal.
S. S. Gillett, Penn-Yan, barrel of flour, no better specimen exhibited, ... Silver Medal and Diploma.

RAWSON HARMON, Wheatland.
PETER CRISPELL, Jr., Hurley.

No. 56. BUTTER.

B. S. Carpenter, Elmira, Chemung co., best lot (quality as well as quantity considered,) made from 5 cows in 30 consecutive days, 25 lbs. of the butter exhibited, ... $25
R. T. Carpenter, Southport, Chemung county, best 25 lbs. of butter made in June, ... 15
Milton Slawson, Chemung, 2d best do, ... 10
Joshua S. Holbert, Chemung, 3d best do, ... 5
Joshua Ballard, Cortlandville, Cortland county, 4th best do, Trans.
R. T. Carpenter, Southport, Chemung county, best 50 lbs. made at any time, ... $15
Joshua S. Holbert, Chemung, 2d best do, ... 10
Milton Slawson, Chemung, 3d best do, ... 5
John Wormley, Elmira, best half dozen butter firkins, ... 2
Myron H. Ferris, ag't, Elmira Manufacturing Company, best half dozen butter tubs, ... 2
Miss Martha C. Wheat, Elmira, for very superior crock of butter, ... 5

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GIRLS UNDER 21 YEARS OF AGE.

Miss Hannah E. Carpenter, Southport, Chemung county, best lot of butter, not less than 10 lbs., made at any time,.....Silver Cup.

Miss Martha Holbert, Chemung, 2d best lot of butter, do,.....Pair Butter Knives.

Miss Helen A. Cox, Southport, Chemung county, 3d best do,.....Set Tea Spoons.

Miss A. M. Benedict, Chemung, 4th best do, ...S. Silver Medal.

DISCRETIONARY.

Jacob Lowman, Chemung, for butter in tubs, short of weight required, but would have received premium if full weight,.....Diploma.

The committee remark that the butter, as a general thing, was overworked.

GEORGE BOGUE, Canton.
HENRY DOWIE, Andes.
SENECA B. STEWART, New-York.

No. 57. CHEESE.

ONE YEAR OLD, AND OVER.

Mrs. Wm. Ottley, Phelps, Ontario county, 4th best 100 lbs., $5

LESS THAN ONE YEAR OLD.

Moses Kinney, Truxton, Cortland county, best 100 lbs.,... 20

S. M. Cox, Otto, Cattaraugus county, 2d best do, ... 15

Goldsmith, Denniston, Prattsburgh, Steuben co., 3d best do, 10

Mrs. Wm. Ottley, Phelps, Ontario county, 4th best do,.... 5

Lewis Peck, Phelps, Ontario county, 5th best do,.....Trans.

DISCRETIONARY.

Wm. W. Bartlett, Campbell, specimen of cheese,.....Trans.

Almond Benjamin, Centerville, do .....Trans.

J. H. Neely, Belfast, do .....Trans.

A. G. Lillebridge, Pike, do .....Trans.

Sam'l Benedict, Southport, Chemung county, for cheese boxes,.....Trans.

EDWIN S. HAYWARD, Brighton.
ALFRED FITCH, Riga.
RAWSON HARMON, Wheatland.

No. 58. SUGAR AND HONEY.

E. W. Phelps, Elizabethtown, N. J., best 20 lbs. honey,... $5

John Holbert, Chemung, 2d best do,..... 3

Jas. C. Ellston, Elmira,.....Trans.

W. B. HANFORD, Walton.
W. F. COAN, Townsendville.

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CLASS VI—DOMESTIC MANUFACTURES, &c.

No. 59. SILK AND WOOLEN GOODS—No. 1.

Mrs. Wm. P. Ottley, Phelps, Ontario county, best pair woolen blankets,..... $8
Mrs. Dan'l Bennett, Horse Heads, Chemung county, 2d best do, ... 6
Mrs. J. T. Van Namee, Pittstown, Rensselaer county, 3d best do,..... 4
Mrs. J. T. Van Namee, Pittstown, Rensselaer county, 2d best 10 yards of woolen cloth,..... 6
Mrs. F. J. Hicks, Bristol, Ontario county, best 10 yards woolen flannel,..... 8
Mrs. Chs. Morrell, Lansing, Tompkins co., 2d best do,.... 6
Mrs. E. C. Bliss, Westfield, Chautauque county, 3d best do, 4
Mrs. Wm. P. Ottley, Phelps, Ontario county, ...Trans.
Mrs. E. C. Bliss, Westfield, Chautauque county, best 15 yards of woolen carpet,..... $8
Mrs. B. F. Slater, Millport, Chemung county, best hearth rug,..... 4
Mrs. M. B. Wheeler, Rock Spring, Schuyler county, 2d best do, ... 3
Mrs. Chs. Evans, Southport, Chemung county, best rag carpet, 15 yards, ... 6
Mrs. Henry Barney, Elmira, 2d best do,..... 4
Mrs. Chs. Taber, Cortland, Cortland county, 3d best do,... 2
Mrs. Wm. P. Ottley, Phelps, Ontario county, 4th best do, Trans.

DISCRETIONARY PREMIUMS.

Mrs. J. T. Van Namee, Pittstown, Rensselaer county, wool and cotton flannel,..... $4
Mrs. T. S. Frost, Catlin, Chemung county, three yards full cloth, ...Diploma.
Hamlin & Rice, Elmira, for fine display of cloaks, talmas, carpets, &c.,.....Diploma.
E. F. Havens, Elmira, case of silk and fancy goods,....Diploma.

H. D. FAULKNER, Boonville.
J. KENDALL, Ithaca.
AARON RILEY, East Huron.

No. 60. DOMESTIC MANUFACTURES—No. 2.

Mrs. S. A. Bunce, Vernon, Oneida county, best double carpet coverlet,..... $6
Mrs. E. D. Ensign, Kirkwood, Broome county, 2d best do, 4

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Mrs. Dan'l Tuttle, Reading, Schuyler county, 3d best do,.. $2
Mrs. J. T. Van Namee, Pittstown, Rensselaer county, best 10 yards kersey, ... 6
Mr. Chs. Tabour, Cortland, Cortland county, 2d best do,... 4
Miss Anna Wynkoop, Chemung, Chemung cuunty, 3d best do, 2
Mrs. Jacob Albright, Groton, Tompkins county, best pair woolen knit stockings, ... 2
Mrs. E. A. Benjamin, Centreville, Allegany county, 2d best do, ... 1
Mrs. Wm. P. Ottley, Phelps, Ontario county, best pair woolen wove stockings, ... 2
Mrs. Wm. P. Ottley, Phelps, 2d best do,..... 1
Mrs. E. A. Benjamin, Centreville, Allegany county, best pair woolen fringe mittens,..... 2
Mrs. J. T. Van Namee, Pittstown, Rensselaer county, 2d best do, ... 1

DISCRETIONARY.

Miss Anna Wynkoop, Chemung, Chemung county, best bunch of yarn,..... 2
Mrs. Charles Evans, Southport, Chemung county, 2d best do, 1
Mrs. T. S. Frost, Catlin, Chemung county, 3d best do,....Trans.

W. B. BURNETT, Lyons.
J. B. BURLEW, Sheldrake.

No. 61. DOMESTIC MANUFACTURES—No. 3.

Mrs. Charles Dense, Southport, Chemung county, 3d best 10 yards of linen,..... $4
Mrs. J. T. Van Namee, Pittstown, Rensselaer county, best 10 yards linen diaper,..... 8
Mrs. E. C. Bliss, Westfield, Chautauque county, 3d best do, 4
Mrs. J. T. Van Namee, Pittstown, Rensselaer county, best 15 yards tow cloth,..... 5
Miss Ruth S. Dense, Southport, Chemung co., 2d best do,.. 3
Mrs. Henry Barney, Elmira, best pair cotton wove stockings, 2
Mrs. Wm. P. Ottley, Phelps, Ontario county, 2d best do,... 1
Mrs. J. T. Van Namee, Pittstown, Rensselaer county, 2d best pair linen wove stockings,..... 1

SPECIAL.

Mrs. M. P. Smith, Lowville, cotton counterpane,..... 3

AZEL B. HULL, Belvidere.
JOSEPH S. HOARD, Mansfield, Pa.

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No 63. NEEDLE WORK, &c.

Mrs. John C. Moore, Hume, Allegany county, best silk embroidery, ... $3
Mrs. Myram Cole, Elmira, Chemung county, best shawl embroidery, ... 3
Miss Lucy A. Stowe, Binghamton, Broome county, 2d best do, ... 2
Miss Lucy A. Stowe, Binghamton, Broome county, best cloak or Cape embroidery, ... 3
Miss Julia Covell, Elmira, 2d best do, ... 2
Miss Lucy A. Stowe, Binghamton, Broome county, 3d best do, ... 1
Mrs. Dan'l S. Carr, Franklin, Delaware county, best scarf and bag embroidery, ... 3
Miss Mary C. Billings, Elmira, best toilet cushion embroidery, ... 3
Mrs. F. J. Hicks, Bristol, Ontario county, best specimen of Turkish embroidery, ... 3
Miss Eliza Foulk, Chemung, Chemung county, 2d best do, .. 2
Mrs. A. D. Moore, Corning, Steuben county, 3d best do, ... 1
Miss E. R. Green, Havana, Schuyler county, best French needlework collar and handkerchief, ... 3
Miss A. Dixen, Canandaigua, Ontario county, 2d best do, .. 2
Miss D. J. Cooley, Elmira, 3d best do, ... 1
Mrs. Beatty, Geneva, best specimen worsted embroidery, .. 3
Miss Marion A. Wheeler, Schuyler county, 2d best do, ... 2
Mrs. H. M. Patridge, Elmira, 3d best do, ... 1
Miss Sarah H. Hart, Elmira, best chair, (cushion and back,) 3
Mary A. Brown, Corning, Steuben county, 2d best do, ... 2
Miss Mary C. Billings, Elmira, 3d best do, ... 1
Mrs. S. G. Andrus, Elmira, best ottoman cover, ... 3
Mrs. C. Willard, Owego, Tioga county, 2d best do, ... 2
Mrs. W. L. Gibson, Elmira, 3d best do, ... 1
Mrs. Sarah Scofield, Dryden, Tompkins county, best embroidered piano or table spread, ... 3
Mrs. E. F. Wiggins, Elmira, 2d best do, ... 2
Miss Mary Jane Housten, Elmira, 3d best do, ... 1
Mrs. E. P. Hart, Elmira, best specimen papier mache, ... 3
Miss E. Gleason, Elmira, 2d best do, ... 2
Miss B. Lindrum, Elmira, best silk bonnets, domestic, ... 3

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Mrs. A. Soper, Elmira, 2d best do,..... $2
Mrs. J. Sherman, Elmira, 3d best do,..... 1
Mrs. J. Sherman, Elmira, best straw bonnets, domestic, ... 3
Miss C. Galatin, Elmira, best ornamental shell work, ... 3
Miss Arrabella Mills, Broome county, 2d best do,..... 2
Mrs. J. T. Van Namee, Pittstown, Rensselaer county, 3d best do, ... 1
Mrs. E. F. Wiggens, Elmira, best specimen wax flowers,.. 3
Miss E. Gleason, Elmira, 2d best do, ... 2
Mrs. A. T. Jeffrey, Cortland county, 3d best do,..... 1
Miss Mary A. Walker, Havana, Schuyler county, best specimen pencil drawings, by lady,..... 3
Miss Sarah H. Hart, Elmira, best specimen crayon painting, by lady,..... 3
Miss Hattie Grover, Elmira, 2d best do, ... 2
Miss E. Gleason, Elmira, best oil painting, (figures) by lady,..... 5
Miss Mary A. Walker, Havana, Schuyler county, 2d best do, 3
Mrs. Frances Sinnett, Southport, Chemung county, 3d best do, ... 2
Mrs. G. H. Post, Painted Post, Steuben county, best oil painting, (landscape,) by lady,..... 5
Mrs. J. Sherman, Elmira, 2d best do,..... 3
Mrs. Frances Sinnett, Southport, Chemung county, 3d best do, ... 2
Miss Mary Weed, Binghamton, best embroidered h'dk'f,.. 3

DISCRETIONARY.

Mrs. C. Yauman, Syracuse, for hair flowers, ...Diploma.
Mrs. E. R. Greene, Havana, Schuyler county, for hair flowers, ...S. S. Medal.
Mrs. Sarah A. Trowbridge; New-York, for ladies corsets, Diploma.
Miss Sarah H. Hart, Elmira, Silk quilt,.....Diploma.
Miss Carrie E. Lawyer, Binghamton, for pair of slippers. Diploma.
Miss Arrabella Mills, Binghamton, for vase of paper flowers, ...Diploma.

SPECIAL.

Adam Henry, native, Tuscarora Reservation, ladies bead work,.....

Mrs. M. P. SMITH, Binghamton, Chairman.

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CLASS VII—PAINTINGS, AND MISCELLANEOUS DEPARTMENT.

No. 64. PAINTINGS, &c.

O. B. Evans, Buffalo, N. Y., photographs, in oil, water colors and India ink,.....Gold Medal.
William Loyd, Philadelphia, stereoscopic views on glass, by F. Langenheim, and stereoscopic cosmoramas, ...Diploma.
A. P. Hart, Elmira, crystaliotype views, 1st premium, Diploma.
A. P. Hart, Elmira, crystaliotype views, 2d premium,....Trans.
John Winter, Syracuse, paintings in oil, 1st premium, S. Medal.
John T. Sinnett, Elmira, 2d premium, ...S. S. Medal.
H. E. Pohlman, Elmira, wood engravings, 1st premium,....Dip.
Miss O. H. Frazer, Elmira, wood engraving, 2d premium, S. Medal.
Jefferson Frazer, Elmira, 1st premium on card engraving, S. Medal.
Jefferson Frazer, Elmira, Fruit painting, in water colors,...Dip.
M. L. Williams, Elmira, daguerreotypes, 1st premium, ...Dip.
W. J. Moulton, Elmira, photographs, ...S. Medal.
Francis Collingwood, Elmira, 4 drawings,.....Diploma.
W. C. Potter, Elmira, 3 oil paintings,.....Diploma.
Miss Emeline Gleason, Elmira, 2 Grecian paintings,...Diploma.
A. O. Penoyer, Havana, Schuyler county, two specimens of penmanship,.....Diploma.
Miss Alice L. Jones, Elmira, 11 years of age, pencil drawing, ...Diploma.
John Symes, Niagara city, 3 oil landscape paintings,...Diploma.
J. W. Einbiegler, Buffalo, painting on wire,.....Dip. & Trans.
H. Van Ingen, Rochester, 2 paintings of horses, ...Diploma.

SPECIALLY COMMENDED.

A. G. Shaver, of Geneva, monochromatic paintings and pencillings, very beautiful, by D. G. Shaver,...Dip. & Trans.
Lithography of E. Nott, do,.....Diploma.
Miss A. Wynkoop, Chemung, 12 years old, pencil sketch, S. Medal.

CHARLES LEE, Penn Yan.
C. M. LEUPP, New-York.
J. S. BUSH, Tioga, Pa.

No. 65. SILVER WARE, CUTLERY AND BRITANNIA.

C. F. Hill, Owego, Tioga, best exhibition of silver ware, Silver Medal.

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Platt Cole, Elmira, best exhibition of table cutlery, American manufacture, ...Silver Medal.
Harris & Vincent, Elmira, best exhibition of pocket cutlery, Silver Medal.

ALVAN WHEELER, Binghamton.
S. AYRES, Elmira.

No. 66. STOVES—(COOKING.)

Harris & Vincent, Elmira, Chemung county, best cooking stove for wood fire, "Improved Empire State,".....S. Medal.
Samuel S. Granger, Horseheads, Chemung county, 2d best do, "Morning Star," .....S. S. Medal.
Charles B. Loveless, Syracuse, Onondaga county, best cooking stove, for coal, "Western World Air Heating,"..S. Medal.
Harris & Vincent, Elmira, "Belle of Utica," 2d,.....S. S. M.
J. J. Updigraff, Elmira, Chemung county, best furnace, or other apparatus for warming houses, economy of construction and consumption of fuel, and security of premises to be taken into consideration,.....S. Medal.

DISCRETIONARY.

Dudley & Ball, Buffalo, Erie county, for Hathaway's large cook stove for hotels,.....S. Medal.
J. S. & M. Peckham, Utica, Oneida county, for best assortment of cooking and six plate stoves,.....Diploma.
J. S. & M. Peckham, Utica, Oneida county, for improved farmers' boiling furnace,.....S. S. Medal.
John Fisk, Niagara city, for portable wood gas fixture,.S. Medal.

CHAS. H. ERWIN, Painted Post.
P. P. BRADISH, Lyons.
ELI WHEELER, Elmira.

No. 67. STOVES—(PARLOR.)

D. G. Stafford, Syracuse, Onondaga county, best ornamental Parlor stove,.....Silver Medal.
A. O. Norcott, Seneca Falls, Seneca county, 2d best do, S. S. Medal.
J. S. & M. Peckham, Utica, Oneida county, best hall stove, S. Medal.
J. S. & M. Peckham, Utica, Oneida county, 2d best do, S. S. Medal.
J. S. & M. Peckham, Utica, best hollow ware,.....S. S. Medal.

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DISCRETONARY.

J. S. & M. Peckham, Utica, for ring coal burner,.....Diploma

M. M. SMITH, Lowville.
ROBERT ADAMS, Cuba.

No. 68. LEATHER, INDIA RUBBER GOODS, &c.

W. J. McCrackin, Rochester, best specimens of trunks, Diploma.
James Thompson, Corning, Steuben county, best calf skins, Diploma.

DISCRETIONARY.

J. L. & A. Randall, Albany, for lot of boots and shoes, Diploma.
Wm. H. Cross, Rochester, for machine belting, R. Watrous, agent, Elmira,.....Diploma.
McDonald & Palmer, on 2 hides of belt leather,.....Diploma.

OLIVER N. SHIPMAN, Springfield Center.
L. MILLPAUGH, Ithaca.
WM. HOFFMAN, Jr., Chemung.

No. 69. CABINET WARE.

DISCRETIONARY.

S. B. Hubbell & Co., Elmira, Chemung county, on lounge chair, ...Diploma.
Joseph Mathews, Candor Centre, Tioga county, on sofa, lounge, and invalid bed combined, ...Diploma.
Mrs. H. Vermylia, Elmira, Chemung county, on "What Not Stand,".....Diploma.
Miss Marian A. Wheeler, Schuyler county, on ornamental table, ...Diploma.

E. D. VAN SLYCK, Homer.
ROBERT ENNIS, Lyons.

No. 70. CARRIAGES.

J. Hill, Elmira, Chemung county, best double carriage, Diploma.
Wm. Brundage, Geneva, best single top buggy,.....Diploma.
J. Hill, Elmira, Chemung county, best single riding buggy, Diploma.
Buckley & Thorne, Horseheads, Chemung county, best pleasure wagon, ...Diploma.
J. Hill, Elmira, Chemung county, best double lumber wagon, Diploma.
J. Hill, Elmira, Chemung county, best express wagon, Diploma.

DISCRETIONARY.

H. Lettington, Norwich, Chenango county, on buggy, S. S. Medal.

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S. Hadden, Chester, Orange county, on top buggy, ...S. S. M.
Clark & Dye, Groton, Tompkins County, on 2 fancy buggies, S. S. M.
David M. Grant, Buffalo, patent spring top carriage, ...S. S. M.

W. S. HOYT, Ithaca.
J. S. LEWIS, Geneva.
W. P. RANDALL, Cortlandville.

No. 71. CLOTHING, HATS, FURS, &c.

S. G. Comstock, Elmira, best exhibition of hats and caps, Diploma.
Gardner & Whiting, Elmira, best collection of furs,....Diploma.

CHA'S G. RIGGS, Turin.
VINCENT WHITNEY, Binghamton.

No. 72. DISCRETIONARY.

The committee on discretionary premiums beg leave to report, and hereby award the following premiums:

Benjamin Payn, Albany, for exhibiting fine specimens of cut tobacco and segars,.....S. Medal.
Charles C. Moore, of Binghamton, for drugs, chemicals and perfumery,.....S. Medal.
James J. Butler, agent, 59 Vine street, Cincinnati, Butler's mercantile and office writing fluid; very superior, ..S. Medal.
Wm. H. Butler & Parr, 554 Fifth street, Cincinnati, merchants' and bankers' fluid; very superior, ...S. Medal.
Thomas Humphreys, Reading, Pa., for preparation to prevent rust in iron and steel, ...Trans.
Wm. E. Reifsnyder, Reading, Pa., hair oil, ...Trans.
Frank Hall, Elmira, for decorated wall paper,.....S. Medal.
A. H. Stone, Elmira, one case visiting cards, ...Trans.
Wells & Provost, N. Y., (Wm. Lee, agent,) one case Pratt's self-sealing cans,.....Trans.
Stevens & Ellithorp, Elmira, for outside window blinds, do inside,.....Trans.
M. J. McCornal, Elmira, a glass ornamental sign, ..S. S. Medal.
R. Watrous & Co., Elmira, one grind stone, a good article, Norton.
W. Demarest, Elmira, two doors and two blinds, ...Barry.
J. Johnson, Washington, D. C., one washing machine, Pat. Office Report.
D. T. Billings, Elmira, for good specimen of wagon spokes, Downing.

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J. H. Rogers, Elmira, twelve bundles wagon spokes, ..Downing.
Wm. H. Spaulding, Elmira, one set bench planes, ...Norton.
Daniel Halladay, South Coventry, Conn., Frederick Frank, agent, Brattelboro, Vt., windmill, a good invention, ... Dip.
Warren J. Johnson, Moravia, Cayuga county, washing machine, ...Trans.
A. O. Norcott, Seneca Falls, tin dressing box, a convenient article; one single lamp, superior finish, ...Trans.
A. McKinney, Horseheads, Chemung county, gauge for carriage tops,.....Pat. Office Report.
Cowing & Co., Seneca Falls, one fire engine, a good engine, Norton.
S. P. Coats, Albany, two frames card writing,.....Norton.
F. O. Rogers, Elmira, a model for carriage wheels, ...Barry.
J. P. Metcalf & Co, Phillipsville, Allegany county, one dozen patent pails, and half a dozen nests of bail boxes, Trans.
John Knox, Rushville, Yates county, one pair improved pinchers, original and useful, one pistol and knife combined new invention,.....Trans. and Downing.
Truman S. Galusha, Rushville, Yates county, five corn baskets,.....Barry.
A. R. McLean, W. Dresden, Yates county, gang saw shingle mill, well adapted for doing much work in a given time, Trans.
John Wormley, Elmira, half flour barrel, highly finished, Norton.
Curtis, Erwin, Brooks & Co., Painted Post, Steuben county, one gang gate for sawing, simple in arrangement, and the saws easily adjusted, ... Dip.
Curtis, Erwin, Brooks & Co., one throttle valve, ...S. Medal.
Curtis, Erwin, Brooks & Co., a saw gummer, or upset, a new apparatus for gumming saws, ...S. S. Medal.
Curtis, Erwin, Brooks & Co., one Eng. mill stirrup,.....Trans.
F. S. Pease, Buffalo, a sample machinery oil; one ditto lard oil, ... Dip.
F. Lyons, Barton, Tioga county, head and tail blocks for Saw mill, ...Trans.
T. F. Collins & Co., Buffalo, blank books, very neatly bound, admirably ruled with mineral ink, ... Dip.
George T. Thompson, Seneca Falls, clothes line reel; a capital article for house keepers, ...Barry.
J. D. & W. H. Martin, Elmira, four pieces ornamental castings, ...Barry.

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Huntington & Platts, one calendar clock, keeps days of year, month, week, hour, minute, second, winds in 30 days,... Dip.
R. Corbyn & Brothers, Bainbridge, Chenango county, water wheel, ...Trans.
Palmer & Co., New-York city, one case of artificial legs; a new-mode of connecting joints, ... Dip.
M. B. Royal, Waverly, Tioga county, one saw mill dog; a new article, ...Trans.
G. S. Blodgett & Co., Burlington, Vt., four portable ovens; well arranged and useful in the kitchen department,...Trans.
P. A. La France, Elmira, one specimen of oak graining, one scroll sign iron, beautifully done, ... Dip.
Harris & Cooley, Elmira, 4 white pine planks, interesting from the forest,.....Thomas.
Benjamin F. Willard, Elmira, one refrigerator, a new mode of ventilating,.....Trans.
S. P. Kittle, Buffalo, patent candle molding machine, cooled by ice water, ... Dip.
J. Frazer, Elmira, two frames cromatic show cards, fine specimen of work,.....Norton.
J. P. Hickcock, Marlboro, Stark Co., Ohio, machine for rounding and leveling barrel heads,.....Thomas.
Elisha Waters, Troy, N. Y., atmospheric breast cups, and cupping instruments, ... Dip.
J. W. Einbiegler, Buffalo, wire work, a beautiful display, articles finished in exquisite taste,.....S. Medal.
Adam Henry, Native Tuscarora, Lewistown, Niagara Co., beautiful bow and arrow, ...S. S. Medal.
F. D. Green, Elmira, fire engine "Eureka," a beautiful specimen of mechanical skill,..... Dip.
G. F. Wood, Ulysses, Tompkins Co., conical valve to an oscillating steam engine, simple in construction,.....Trans.
Abraham Krowl, Elmira, half dozen horse shoes, ...Thomas.
J. P. Lindsay, Syracuse, specimen of lightning rods.....Norton.
J. E. Cheeney & Co., Rochester, Kedzie's rain water filterer, well constructed for that purpose, ... Dip.
Joseph Keech, Waterloo, Seneca Co., 1 washing machine and washing board, ...Barry.
M. W. E. Purchase, Saratoga, specimen of card writing, Downing.
J. W. Armitage, Troy, Wheeler and Wilson's improved sewing machines, and improved cloth hammer,..... Dip.
Parsons & Johnson, Buffalo, leger and journal, good taste,.. Dip.

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S. Frisbee, Fredonia, Chautauque Co., gravitating gate,..Norton.
E. E. Hendricks, Michigan, portable cider mill, ...Thomas.
E. E. Hendricks, Michigan, apple and peach parer, ...Barry.
D. D. Truesdale, Vestal Centre, Broome Co., planing machine for shingles,.....Norton.
P. Hollingworth & Son, Utica, 2 barrels bone dust, average price, $2.00 per bbl., well known to be a good fertilizer, and deserves the attention of farmers,.....Thomas.
A. Wagman, Elmira, a sugar pyramid in a refined *taste*, Norton.
John Kendall, New Lebanon, 1 case thermometers, beautifully finished, ...S. S. Medal.
E. Morris, Elmira, 1 pair buck horns, ...Norton.
H. R. Gardner, North Granville, N. Y., 1 lot of roofing slate, very important to the community,..... Dip.
St. Clair & Ward, New-York, Bailey's patent car seat, a decided improvement in car seats, ... Dip.
Samuel Davidson, Greece, Monroe county, stone drilling machine,.....Trans.
S. M. Bassett, Fulton, Oswego county, 4 specimens penmanship, elegant,.....Barry.
S. M. Bassett, Fulton, Oswego county, 3 leather work frames, beautiful,.....Thomas.
A. T. Sellover, Ithaca, specimen card writing and penmanship, ...Barry.
J. M. Beck, Harrisburgh, Pa., specimen of sheet tin printing, Trans.
J. B. Drawbaugh, Cumberland Pa., stave, heading and shingle cutter,.....Norton.
G. S. Hill, Burlington, Bradford Co., Pa., 1 ox yoke, 1 pair bows, and 2 ax helves,.....Trans.
W. B. Gregory & Co., Albany, one case of saws, superior workmanship, ... Dip.
Charles Ketchum, Penn Yan, 1 model saw mill,.....Trans.
Daguerreotype cleaner, a decided improvement, ...Trans.
F. A. Gleason, Rome, Oneida county, a miter dovetailing machine, a capital good machine,.....Silver medal.
J. C. Elma, New Bedford, Mass., 1 box chessmen, ...Thomas.
Dr. E. Daniels, Union, Broome Co., two adjustable invalid bedsteads, this article the committee highly recommend.. Dip.
J. C. Fellows, Buffalo, Warren's chemical lamp black,....Trans.
E. Hosford, Owego, piano forte, peculiar for fulness of volume of tone and clearness in expression,..... Dip.

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Dyer & Bratt, Elmira, iron fence pattern,.....Norton.
E. S. Watson, Chenango Forks, self-adjusting saw set,....Trans.
S. S. Sage, Windsor, Broome Co., adjustable tram block for stationary bridge, apparently a useful article, ... Dip.
E. Bless, Minerva, Mason Co., charcoal self-heating smoothing iron,.....Trans.
B. Coughlin, New-York, vegetable ivory from California,..Trans.
C. C. Rice, Olean, Cattaraugus Co., self-setting and regulating shingle machine, ...Trans.
J. Disbrow, Haverstraw, Rockland Co., 1 case Isabella wine, Dip. and silver medal.
J. C. House, Lowville, Lewis Co., 1 alarm bedstead, and clock attachment, ...Barry.
Winnie, Link & Co., Albany, 3 bent slate frames, and one rim for wheels, new mode of bending timber by steam, Norton.
H. Patten, Rochester, carpet fastener, clothes pins, bag fastener, sash lock, gate lock, ...Thomas.
Bryant, Lusk & Stratton, Buffalo, six specimens of writing, Downing.
Charles A Hulse, Washingtonville, Orange Co., 4 bottles native grape wine, ...Diploma.
S. B. Hubbell, & Co., Elmira extension table,.....Trans.
Jacob Henry & Sons, Albany fire brick, ...Trans.
Same—Grates for burning tan bark and wet material, ...Dip.
C. C. Bisby, Rochester, patent toilet and shower bath, Downing.
Same—1 patent cast iron bench plate, ...Norton.
T. C. Maxwell & Bros., Geneva, 9 specimens of fruit and forest trees, ...Downing.
C. M. Merriman, Southport, Chemung county, 2 specimens of fruit trees,.....Downing.
Thorp, Smith, Hanchett & Co., Syracuse, 2 specimens of dwarf pear trees,.....Downing.
Jos. Paxton, Catawissa, Pa., Catawissa raspberry, a fine collection of ever bearing fruit,.....Trans.
Miles Baldwin, Chemung, Chemung county, 2 peach trees, Barry.
O. C. Hill, Malone, Franklin county, air tight door,.....Trans.
Geo. Benjamin, Avoca, Steuben county, 1 portable cottage bedstead, ...Norton.
Boyd, Rosse & Co., Shamokin, Pa., 4 specimens red ash coal, Dip.
Cochran, Peal & Co., Shamokin, Pa., 1 specimen white ash coal, anthracite,.....Dip.
H. Longinecker & Co., Shamokin, Pa , 1 specimen pig iron, Dip.

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Albert N. Smith, Rochester, reclining railroad car seat,....Dip.
Same—Machine belt clasps,.....Trans.
Stephen Butler, Brooklyn, N. Y., patent carriage wheel, double felloes,.....Trans.
Mrs. H. Luce, Elmira, 1 bottle white currant wine, ...Trans.
A. G. Owen, Big Flats, 1 bottle red currant wine,.....Trans.
John V. Grove, Ovid, Sheldrake P. O., Seneca county, map and drawing of his own farm, very neatly executed, S. medal.
A. J. Warner, Skaneateles, 3 specimens of penmanship, Downing.
E. & T. Fairbanks & Co., St. Johnsbury, Vt., rotary smoothing iron,.....Thomas.
Same—One gold tester, ...Barry.
Edward Snyder, Milton, Pa., sausage cutter, ...Norton.
T. C. Taylor, Philadelphia, Pa., sample soap, a good variety, made without grease,.....Norton.
H. C. Hart, New-York, sample of clocks, fine assortment. Thomas.
Mrs. J. T. Vanamee, Pittstown, Rensselaer county, fancy picture frame,.....Thomas.
Eagle hose co. No. 2, Buffalo, hose cart,.....S. Medal.
A. Ross, Rochester, yeast cakes and bread, superior articles, Trans.
John Henderson, Horseheads, Chemung county, improved cap and fastener for carriage axletree,.....Trans.
D. C. Cary, Alden, Erie county, specimen sash fastening, Norton.
John Shelley, Dansville, Livingston county, tubs and pails, Thomas.
John Snyder, Rochester, alarm clock, meritorious concern, worth $800, ... Dip.
A. Wolcott, Detroit, Michigan, lithographic view of planing machine, and boards planed by same, successful effort of artist, ...Trans.
John H. Coleman, Buffalo, guilt portrait frames,..... Dip.
Charles E. Lewis, Buffalo, 1 specimen of lithography, ...Trans.
John H. Kent, Brockport, N. Y., imitation marble, ...Trans.
Luce & Post, Elmira, Catawissa raspberry,.....Barry.
Palmer & Newton, Albany, stove lining for coal stoves,.... Dip.
D. D. Kniffin, Elmira, Fire Engine No. 3, in good order,..Trans.
H. N. Goodman, New-Haven, Conn., machine for paring and slicing apples, 15 or 20 bushels in an hour, ...Trans.
C. D. Van Alen, Baldwinsville, Onondaga county, invalid bedstead, ...Trans.

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Horace Harris, Gorham, Ontario county, improved bench plane, ... Dip.
G. W. Davis, Brooklyn, N. Y., inflammatory extirpator, ..Trans.
S. Colburn, Derby, Conn., self-sharpening knife for mowing machine, important, ...Trans.
W. Hannun, Elmira, penmanship and cards, ...Trans.
W. G. Rutter, Elmira, fire engine No. 4, "Young America," Trans.
John W. Wheeler, Cleveland, Ohio, 1 improved carriage, a good improvement, new mode of adjusting hub, ...Trans.
John Russell, Troy, N. Y., 1 rifle, a peculiar twist, ... Dip.
S. P. Cunningham, Havana, Schuyler county, 10 cherry trees, 3 peach do, ...Trans.
J. Eliason, Elmira, 1 piano forte, (T. Greene, maker, exhibited by T. Eliason.) This instrument is peculiar for softness and sweetness of tone, ... Dip.
Dudley & Ball, Buffalo, Schorley's patent refrigerator, ... Dip.
G. M. Harris, Elmira, 1 washing machine, ...Norton.
J. Johnson, Washington, D. C., cylinder for muzzle loading fire arms, ...Norton.
H. G. Tygert, Northumberland, Pa., specimen cold blast pig iron, ...Trans.
Andrews, Burbage & Co., Elmira, assortment of saws, ... Dip.
G. M. Harris, Elmira, 1 cream freezer, ...Barry.
C. B. Hutchinson, Auburn, new method of hanging Muley saw mill saws, ...Barry.
Platt Cole, Elmira, case mechanic's tools, highly finished, ..Trans.
S. S. Hammond, N. Y., sample wrapping paper, ...Barry.
Elwanger, & Barry, Rochester, specimen of two varieties of ever living raspberries, seedlings, ...Downing.
A. R. Davis, Deposit, Delaware county, 1 rifle, ...Barry.
Z. M. B. Bunnell, Deposit, Delaware county, 1 rifle, ...Norton.
J. Arnold, Auburn, for specimen of artificial teeth, ...Norton.

The committee, in conclusion, beg leave to state, and they congratulate the public on learning the fact, that the miscellaneous articles submitted for their examination and report, are the greatest number and variety they ever saw at any State Fair; that in the various departments of mechanical and artistic labor, there is shadowed forth in the articles themselves and now on exhibition, the peculiar and varied workings of the human mind, and we can respond with the poet,

"The proper study of mankind is man."

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There is the profound thinker, the bold inventor, the ingenious mechanic, the skilful workman, the artist of fine taste and finish, and all pressing on to gain a step in advance of his predecessor. The progress is now to be seen by the assembled multitude.

It is a matter of interest and a source of congratulation that we live among such a people, and that notwithstanding we have in these articles the evidence that the human intellect has been pushed to its utmost verge, and yet with all these elements in thought, we can contemplate the day of the next annual fair of this Society to be as of this day, and much more abundantly in a good display for variety and usefulness.

A. OSBORN, Albany.
L. DIMMICK, Binghamton.
ORRIN ROBINSON, Elmira.
E. P. BROOKS, Elmira.

The committee on articles not otherwise reported on, report:

Class 7, No. 72, entry 184, Leightenhizer & Co., Reading, Pa., best meat cutting knife, for family use, ...Trans.

Class 7, No. 72, entry No. 100, James W. Lee, Buffalo, Kittle's door fasteners,.....S. Medal.

Class 7, No. 72, entry No. 6. Thomas Humphrey, Reading, Pa., movable seated wagon,.....Trans.

Also horse shoes made by Mike Neeney, (in class 7,) in two heats, ...S. S. Medal.

Class 4, No. 52, entry No. 45, Hayden and Saunders, New-York, exhibited a superior article of brass cocks, oil cups, steam utensils, &c.,.....Trans.

Class 4, No. 51, entry No. 105, D. Chapman & Co., Elmira, a cylinder saw for sawing staves,.....S. S. Medal.

Class 4, No. 50, entry 117, Edwin Wolverton & Co., Milan, Erie county, Ohio, hay, cheese and tallow press,....S. Medal.

Class 7, No. 72, entry No. 178, shingle machine, patented by A. V. Orr, Lancaster Co., Pa., (has had one premium). Favorable notice.

Class 4, No. 50, entry No. 141, grain cleaner, exhibited by George Leach, Owego, N. Y.,.....Trans.

Straw cutting machine, patented by J. W. Webb, ...

Class 4, No. 51, entry No. 161, Downs, Mynderse & Co., rotary iron pump, used for watering fair grounds,.....Trans.

Class 4, No. 52, entry No. 167, D. K. Fitch exhibited a stump machine, patented by Gibson,.....S. Medal.

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D. K. Fitch also exhibited a very superior two horse wagon,

Trans.

P. C. WARD.
D. K. FITCH.
E. BANKS.
JNO. F. MEANS.

CLASS VIII—FLOWERS, PLANTS AND DESIGNS, FRUITS.

No. 73. PROFESSIONAL LIST.

DAHLIAS.

Ellwanger & Barry, Rochester, best collection, ... $6
A. Frost & Co., Rochester, 2d best, ... 3
Ellwanger & Barry, Rochester, best 24 dissimilar blooms, (with names,) 5
Thorp, Smith & Hanchett, Syracuse, 2d best, ... 3
Ellwanger & Barry, Rochester, best 12 dissimilar blooms,.. 3

ROSES.

Ellwanger & Barry, Rochester, for the greatest number of newest and best varieties,..... 8
A. Frost & Co., Rochester, 2d best,..... 2
A. Frost & Co., Rochester, for the newest and best 24 distinct varieties, with names,..... 5

PHLOXES.

Ellwanger & Barry, Rochester, for the greatest number of newest and best varieties,..... 5
Thorp, Smith & Hanchett, Syracuse, 2d best, ... 2

VERBENAS.

Ellwanger & Barry, Rochester, for the greatest number of newest and best varieties,..... 5
A. Frost & Co., Rochester, 2d best,..... 3
Ellwanger & Barry, Rochester, best collection, 3 varieties of American seedlings, not before exhibited,.....Sil. med.

DISRETIONARY.

Thorp, Smith & Hanchett, for the same,.....S. S. medal.

PANSIES.

Ellwanger & Barry, Rochester, best collection, ... $3
Col. E. C. Frost Catharine, Schuyler county, 2d best,..... 2

THOMAS HOGG, Yorkville.
LEANDER WITHERILL, Rochester.
J. S. BUSH, Tioga, Pa.

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No. 74. AMATEUR LIST.

CUT FLOWERS.

Mrs. J. T. Van Namee, Pittstown, Rensselaer county, for the best display, ...Silver medal.
Mrs. Emily Newcomb, Pittstown, Rensselaer county, 2d best, ... $2

VERBENAS.

Frank Hall, Elmira, for the greatest number of newest and best varieties,..... 5
Mrs. J. T. Van Namee, Pittstown, Rensselaer county, 2d best, ... 3
Mrs. J. T. Van Namee, Pittstown, Rensselaer county, best 12 distinct varieties, with names,..... 3
Mrs. Emily Newcomb, Pittstown, Rensselaer county, 2d best, ... 2

GERMAN ASTERS.

Mrs. Emily Newcomb, Pittstown, Rensselaer county, best collection,..... 3
Mrs. J. T. Van Namee, Pittstown, Rensselaer county, 2d best,..... 2

PANSIES.

J. Frazer, Elmira, Chemung county, best collection, ... 3
Mrs. Emily Newcomb, Pittstown, Rensselaer county, 2d best, ... 2

DISCRETIONARY.

Premium recommended for blue seedling verbena, exhibited by Mrs. J. T. Van Namee, Pittstown, Rensselaer county, 1

P. BARBER, Homer.
JAS. VICK, Jr., Rochester.
R. ROBINSON, Scott.

No. 75. GENERAL LIST.

POT PLANTS.

A. Frost & Co., Rochester, best collection of house plants, in pots, of 20 different specimens, ...Cup, value $10
Col. E. C. Frost, Catharine, Schuyler county, 2d best,.... 5

FLORAL DESIGNS.

Chemung county, Mrs. A. C. Ely, Elmira, best,..... 5
Genesee county, Mrs. B. F. Wiggins, Elmira, 2d best,..... 3
Cayuga, Miss Emily F. Choat, Auburn,.....Small Silver medal.
Wayne, Miss Helen Beardsley, Elmira,.....Small Silver medal.
Greene, Miss Kate Murdock, Elmira,.....Small Silver medal.

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Chautauque, Miss Sophia Wier, Southport,.....Breck's Book of Flowers.
Yates, Miss Mary E. Canfield, Elmira, Breck's Book of Flowers.
Putnam, Miss Emma Towner, Elmira, Breck's Book of Flowers.
Saratoga, Mrs. J. L. Woods, Elmira,...Breck's Book of Flowers.
Orange, Miss Wilcox, Elmira,.....Breck's Book of Flowers.
Seneca, Miss Calista Howard, Elmira,..Breck's Book of Flowers.
Otsego, Mrs. Harvey Luce, Elmira,.....Vol. Transactions.
Schoharie, Miss F. E. Bennett,.....Vol. Transactions.
Steuben, Miss A. Covell, Elmira,.....Vol. Transactions.
Oneida, Miss Fanny E. Arnott, Elmira, Breck's Book of Flowers.
Onondaga, Miss Victoria Richards, Elmira,...Vol. Transactions.
New-York city, Mrs. E. F. Havens,.....Vol. Transactions.
St. Lawrence, Miss Helen Howard, Elmira,...Vol. Transactions.
Tompkins, Miss Hattie Sherman, Elmira,.....Vol. Transactions.
Wyoming, Miss A. P. Brooks and Miss Dingledey, Elmira, Vol. Transactions.
Schuyler, Miss A. C. Arnott, Elmira,.....Vol. Transactions.
Tompkins, Mrs. Love, Ithaca, oak leaf design,..Breck's Book of Flowers.
E. P. Brooks, Elmira, 4 specimens of seedling strawberries, Diploma.

BOUQUETS.

A. Frost & Co., Rochester, best pair hand,..... $5
John Wilson, Albany, N. Y., 2d best,..... 3
George A. Hayborn, Ithaca, Tompkins county, best pair parlor,..... 6
Mrs. Love, Ithaca, Tompkins county, 2d best,..... 4

FRANK HALL, Elmira
C. F. CROSSMAN, Rochester.
D. P. PHILLIPS, Syracuse.

No. 76. PROFESSIONAL LIST.

APPLES.

J. Hildreth, Watkins, Schuyler county, greatest number of good varieties, and best specimens correctly named, at least 2 of each,.....Silver cup, value $15
Ellwanger & Barry, Rochester, 2d best,..... 10
J. M. Mattison, Jacksonville, Tompkins county, best 20 varieties, best grown and correctly named,.....Plate, value 10
Thorp, Smith & Hanchett, Syracuse, 2d best,..... 5
C. N. Merriman, Elmira, best 12 varieties,..... 5
A. Frost & Co., Rochester, 2d best,..... 3

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PEARS.

Ellwanger & Barry, Rochester, good varieties, and best,...Silver cup, $15
A. Saul & Co., Newburgh, 2d best,.....Silver cup, 10
Ellwanger & Barry, Rochester, best 20 varieties, best,....Silver plate, value $10
T. C. Maxwell & Bros., Geneva, Ontario county, 2d best,... 5
Ellwanger & Barry, Rochester, best 12 varieties, best specimens, 6 of each, correctly named,.....Plate, 8
A. Frost & Co., Rochester, 2d best,..... 5
Ellwanger & Barry, Rochester, best 6 varieties, best specimens, correctly named, 6 of each,.....Plate, value 5
A. Frost & Co., Rochester, 2d best,..... 3

SPECIAL.

Col. E. C. Frost, Catherine, Schuyler county, 127 varieties of apples, and 73 varieties of pears,..... 10
A. Frost & Co., Rochester, 20 varieties of pears,..... 3
Thorp, Smith & Hanchett, Syracuse, 20 varieties of pears, 3
Thorp, Smith & Hanchett, Syracuse, 100 varieties of pears, 6
A. Frost & Co., Rochester, fruit cornucopia,..... 10
W T. & E. Smith, Geneva, 23 varieties of apples,..... 3
H. Farnsworth, Syracuse, 20 varieties of apples and pears, exhibited by the Fruit Growers' Association, Iowa, are deemed worthy of the highest commendation for their extraordinary beauty, size and flavor,..... 5

W. R. PRINCE, Flushing.
T. L. PREVOST, Greenville.
C. M. HOVEY, Boston, Mass.

No. 77. PROFESSIONAL LIST.

PLUMS.

Ellwanger & Barry, Rochester, greatest number of varieties, and best,.....Plate, value $5

QUINCES.

A. Frost & Co., Rochester, best dozen orange,..... 3

GRAPES.

A. Frost & Co., Rochester, greatest number of good native varieties, best,.....Plate, value 5
E. C. Frost, Catharine, Schuyler county, 2d best,..... 3
Ellwanger & Barry, Rochester, greatest number of varieties, and best grown under glass,.....Plate, value 10
J. Hildreth, Watkins, Schuyler county, best 1 variety,.... 3

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N. Culver, Arcadia, Wayne county, best, ... $5
N. Culver, Arcadia, best, ... 5

SAMUEL MILLER, Rochester.
Dr. W. D. COOK, Sodus Point.
HARVEY LUCE, Elmira.

No. 78. AMATEUR LIST.

APPLES.

Sylvanus Burtis, Oak's Corners, Ontario county, greatest number of good varieties, and best, ...Silver cup, value 15
Wm. Kimball, Penn Yan, Yates county, 2d best, ... 10
D. C. Hillman, Reading, Schuyler county, best, ..Plate, value 10
N. & E. S. Hayward, Rochester, 2d best, ... 5
S. T. Owen, Big Flats, Chemung county, best 12 varieties, 5
Wm. Kinney, Ovid, Seneca county, 2d best, ... 3

PEARS.

E. Dorr, Albany, best 6 varieties, best, ...Plate, value 5
Geo. B. Mallett, Millport, Chemung county, 6 varieties, 2d premium, ... 3
Dr. N. Winton, Havana, Schuyler county, choice collection of pears, ... 2

DISCRETIONARY PREMIUMS.

Ezra Canfield, Elmira, variety of apples, ...Vol. Trans.
V. Ferenburgh, Erwin, Steuben county, do, ...Vol. Trans.
Richard Harris, Ogden, Monroe county, seedling apple, Vol. Trans.
Samuel Marshall, Horseheads, Chemung county, variety of apples, ...Vol. Trans.
Geo. B. Mallett, Millport, Chemung county, do, ...Vol. Trans.
Asher Frost, Millport, Chemung county, do, ...Vol. Trans.
A. S. Diven, Elmira, do, ...Vol. Trans.
C. N. Merriman, Elmira, do, ...Vol. Trans.
Geo. Bechtall, Elmira, do, ...Vol. Trans.
Jas. Powers, Catskill, Greene county, variety of pears, Vol. Trans. and $1
Mrs. J. T. Van Namee, Pittstown, Rensselaer county, variety of apples, ...Vol. Trans.

NELSON WINTON, Havana.
JAS. M. MATTISON, Jacksonville.
W. IVES, Watertown, Jefferson Co.

No. 79. AMATEUR LIST.

PLUMS.

Elisha Dorr, Albany, N. Y., greatest number of varieties, and best grown specimens, ...Plate, value $5

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Geo. Clarke, Springfield, Otsego county, 2d best do., ... $3
Elisha Dorr, Albany, best 6 varieties, 6 of each, ... 3
Elisha Dorr, Albany, best 1 variety, 12 specimens, ... 2

QUINCES.

Dr. Nelson Winton, Havana, Schuyler county, best dozen, .. 3
N. & E. S. Hayward, Rochester, 2d best, ... 2

GRAPES.

A. S. Diven, Elmira, native varieties, best grown specimens, Plate, value 5
J. M. Kingwill, Havana, Schuyler county, 2d prem., ... 3
Dr. Nelson Winton, Havana, Schuyler county, best 1 variety, ... 2
Robert Covell, Elmira, Chemung county, 2d best, ... 2

CRANBERRIES.

Noble Hill, Caton, Steuben county, best peck domestic cultivated, ...Plate, value 5
Geo. Clarke, Springfield, Otsego county, cranberries and filberts, both fine, ...Diploma.

P. BARRY, Rochester.
A. SAUL, Newburgh.
SAMUEL LOVE.

No. 80. FRUIT OUT OF STATE.

PEARS.

Hovey & Co., Boston, best exhibition, ...Silver cup, value $15

PEACHES.

A. Updigraff, Williamsport, Pa., best exhibition, ...Sil. medal.
To Hovey & Co., of Boston, Mass., who have brought and exhibited 210 varieties of pears, some of them fine varieties, and all correctly named and in good condition, enabling our nurserymen and amateurs to compare them with those grown on our soil and climate, your committee earnestly and unanimously recommend your Society to award to the exhibitors the same premium awarded for the greatest number of varieties and best grown specimens correctly named, 3 specimens each, grown in the State, viz: .....A silver cup, valued at $15

SAMUEL MILLER, Rochester.
W. R. PRINCE, Flushing.
N. WINTON, Havana.
P. BARRY, Rochester.

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PREMIUMS AWARDED AT THE WINTER MEETING, FEBRUARY, 1856.

FARMS.

First, John V. Grove, Ovid,..... $50
Second, John Westfall, Lyons,..... 30
Third, James McLellan, Trumansburgh,..... 20

DAIRY AND GRAZING FARMS.

First, Wm. M. Holmes, Greenwich, Washington county,.. 30
Second, Leonard D. Clift, Putnam county,..... 20

BUTTER.

First, R. T. Carpenter, Southport, Chemung county,..... 15
Second, J. S. Holburt, Chemung county,..... 10
Third, Noah Hitchcock, jr., Homer, Cortland county,..... 5
Fourth, R. H. Gibbs, Harpersfield, Delaware county, S. S. Medal.
Mrs. Wm. H. Sotham, Owego, Tioga county, sample winter made butter from cows fed on carrots and dry hay. This butter was superior, in its make, to any on exhibition. Awarded large Silver Medal.

CHEESE.

First, John Gillet, Scott, Cortland county,..... $15
Second, E. F. Carter, LeRay, Jefferson county,..... 10
Third, Clinton Ringe, Homer, Cortland county,..... 5
Fourth, Moses Eames, Rutland, Jefferson county,.....Trans.

CORN.

J. V. Grove, Ovid, 45 21-100 acres, 4441 bu. ears,....Diploma.

CARROTS.

First, E. C. Bliss, Westfield, Chautauque county, 1,280 bu. per acre,..... $8
Second, E. C. Bliss, 1,120 bu.,..... 5
Third, E. C. Bliss, 650 bu.,.....Vol. Trans.
Jos. H. Coons, statement not complete,.....Vol. Trans.

PEAS.

Norman Gowdy, Lewis county, 52⅝ bu. per acre,..... $8
Second, Asa Otis, Westfield, Chautauque county,..... 3

TIMOTHY SEED.

Lewis Potter, 9¾ bu. per acre,.....Vol. Trans.

CLOVER SEED.

Wm. P. Ottley, Phelps, 33 3-60 bush. per acre,.....Vol. Trans.

CORN FODDER.

E. C. Bliss, Westfield, Chautauque county,..... $3

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OATS.

First, E. M. Bradley, East Bloomfield, 96 8-10 bu. per acre, $15
Second, E. C. Bliss, Westfield,..... 5

SPRING WHEAT.

E. F. Carter, Le Ray, Jefferson county, 3 acres 3 rods yielded $95\frac{3}{4}$ bu., ... 5

DRAINING.

T. C. Maxwell & Brothers, Geneva,..... 20

DRAINING SWAMP DANDS.

Wm. Johnson, Geneva, "Elmwood Farm,"..... 10

IRRIGATION.

E. C. Bliss, Westfield,..... 20

ESSAY.

Sanford Howard, Boston, Essay on Grasses and Herbage,.. 40

GRAIN AND SEEDS.

Best bbl. Spring wheat, David Hess, Fenner, Madison Co.,.. 5
Second do, David Coonradt, Brunswick, Rensselaer county, 3
Third do, O. Howland, Auburn,..... 2
Best bu. Rye, David Coonradt,..... 5
Second do, Volney Burgess, Chatham, Columbia county,... 3
Third do, A. E. Van Allen, Clinton, Rensselaer county,... 2
Best bbl. four-rowed barley, O. Howland, Auburn,..... 5
Best bbl. two-rowed do, O. Howland, Auburn,..... 5
Best bbl. Oats, David Hess, Fenner, Madison county,..... 5
Second do, J. W. Briggs, Macedon, Wayne county,..... 3
Third do, David Coonradt,..... 2
Best bbl. Yellow corn, Volney Burgess, ... 5
Second do, David Coonradt,..... 3
Best bbl. white corn, do, ... 5
Best bbl. Peas, Volney Burgess,..... 5
Second do, N. Gowdy, Lowville, Lewis county,..... 3
Best bbl. Beans, David Coonradt,..... 5
Second do, H. H. Doolittle, Phelps, Ontario county,..... 3
Third do, O. Howland, Auburn,..... 2

D. A. Bulkeley, of Williamstown, Mass., presented samples of Stone Hill potatoes from a crop of 310 bu. per acre, and samples of Spring wheat and Oats, with statement of their cultivation. The crops raised were very creditable, and the samples all excellent. Thanks of the Society to Mr. Bulkeley for his statement of crops.

DISCRETIONARY PREMIUMS.

J. P. Noxon, White Creek, Washington county, Flax Seed, 3

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A. E. Van Allen, Clinton, Rensselaer county, bbl. Buckwheat, ... $3

WINTER FRUITS.

Best 20 varieties of Apples, F. Atwater, Ithaca, $4 and Diploma.
Second best 20 varieties of Apples, Wm. M. Holmes, Greenwich, Washington county,.....$2 and Downing.
Third best varieties of Apples, E. S. Hayward, Rochester, Thomas
Best 10 varieties of Apples, David Coonradt, Brunswick, $3 and Diploma.
Second best 10 varieties of Apples, R. A. Downs, Greenbush, Rensselaer county, ...$1 and Barry.
Third best 10 varieties of Apples, Wm. P. Ottley, Ontario county,.....Trans.
Best dish Apples, F. Atwater, Ithaca,.....S. S. Medal.
Second do, E. S. Hayward, Rochester,.....Trans
Best collection Winter Pears, A. Saul, Newburgh, Orange county,.....Dip. and S. Medal.
Second best collection of Winter Pears, T. C. Maxwell & Bro., Geneva, ...S. S. Medal.
Best variety Pears, E. Dorr, Albany, ...S. S. Medal.
Best specimen Grapes, E. Dorr, Albany,.....S. S. Medal.

SPECIAL PREMIUMS—CHOICE FRUITS NOT ENUMERATED.

E. C. Frost, Tompkins King Apples, Catharine, Schuyler county, ...Vol. Trans.
J. Hildreth, do, Schuyler county, ...Vol. Trans.
J. V. Grove, do, Seneca county,.....Vol. Trans.
Wm. P. Ottley, Spitzenburghs, Ontario county, ...Vol. Trans.
John Westfall, Lyons, exhibited a bottle of Currant Wine which was very superior,.....Sil. Medal.
N. Longworth, Cincinnati, Ohio, Isabella Wine, very fine, Dip.

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